schizophrenia and social networks: ex-patients in the inner city*

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Beginning with Freud's (1958) formulation of the Schreber case, impairment in object relationships has been conceptually linked to serious psychopathology. Subsequent work by Federn (1952), Bak (1965), Fairbairn (1954), Jacobson (1954), Mahler (1968), and Bellak (1969), in particular, detailed the role of disturbance of object relations in schizophrenia. Social scientists using census tract data uncovered evidence of atomistic life styles within geographic areas producing the highest incidence of hospitalized schizophrenics. It was postulated that isolation was a key to etiologic factors in the disease (Faris and Dunham 1939; Jaco 1954; Ware 1956).

Subsequent refutations of isolation as the primary causal element in schizophrenia (Kohn and Clausen 1955) resulted in a temporary waning of interest in the relationship between sociability and psychopathology. More recently, Budson (1977), after reviewing a variety of community maintenance studies, concluded that the presence of a strong "psychosocial kinship system" (comprised of friends, neighbors, and close associates as well as family) was the "crucial factor" in determining program success. Similarly, Strauss and Carpenter (1977) found a high correlation between 5-year outcome scores and previous levels of social contact. They considered prehospital levels of social contact to be one of the three main predictors of outcome in schizophrenia.

Despite the heavy significance attributed to

social relationships in affecting the course of schizophrenia, the methods employed in determining sociability are rather rudimentary and lag well behind the rigorous instruments developed for assessing psychopathology. For example, Strauss and Carpenter (1972) measured levels of social interaction based upon frequency of contacts with "friends." Thus, having "friends" was equated with a high degree of sociability and, conversely, an absence of "friends" was equated with isolation. Lowenthal and Robinson (1976) have observed that the difficulty with friendship studies is that there exists a wide disparity in percepts of friendship networks and definitions of friends by sex, socioeconomic status, and geographic location. Indeed, in an investigation of inner city hotel elderly we found broad conceptual differences about friendship: twenty percent of linkages involving complex personal interactions were considered "acquaintances," whereas 61 percent of casual interactions were rated as "friends" (Sokolovsky and Cohen 1977). Merely employing a friendship index would have markedly distorted the number of relevant social contacts.

Some attempts have been made to go beyond the primitive level of friendship inventories. Hammer (1963–64) examined the density of the network structure (i.e., number of actual links compared to potential ones) in influencing the rapidity of psychiatric hospitalization. Pattison et al. (1975) have employed aspects of social network theory to determine whether the number of contacts and density reflect levels of psychopathology. Their work with a small number of schizophrenics residing within intact families

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pointed to higher degrees of interconnectedness and smaller network size as compared to neurotics and normals.

Because of the widespread acknowledgment of the importance of social networks to schizophrenia, several issues concerning the sociability of schizophrenics need to be clarified and resolved.

• The current state of the art (using friendship indices) must be refined so as to elicit meaningful data concerning social interaction. It is necessary to explore all types of contacts, both quantitatively and qualitatively. Furthermore, investigators must overcome the tendency to lump all schizophrenics within one category. It must be determined whether a diversity of social capabilities exists across the schizophrenic spectrum.

• Many of the studies that have examined social relations of schizophrenics have focused on persons residing within intact families (Brown, Birley, and Wing 1972; Freeman and Simmons 1963; Hammer 1963–64; Pattison et al. 1975). Often, patients being discharged are placed in urban areas away from kin. It is important to know what level of sociability is being maintained: Are they able to generate linkages within their dwellings, or do they exist as isolates? Are they able to establish personal contacts outside their residences, or do they live essentially as "back ward" patients isolated from the community?

• Seminal work by Hammer (1963–64) and Pattison et al. (1975) has suggested that for persons living within families, network interconnectiveness correlates with diagnosis and rate of rehospitalization. It would be worthwhile to know if these correlations occur for individuals situated within an inner city setting and living apart from kin.

• Most significantly, there is a need to know if rehospitalization rates can be predicted on the basis of quantitative or qualitative aspects of social networks.

Methods

The Setting

As part of a nationwide phenomenon, in 1 year alone (1973–74), 35,960 individuals were released from New York State psychiatric institutions and 14,580 of these persons returned to various environments in New York City (*New York Times* 1975). Many have gone to live in one of the approximately 1,000 SRO's (single room occupancy hotels), a majority of which are situated in Manhattan from the Bowery to Harlem.

Since 1971, the Needham Hotel,[1] a large 13-floor privately owned SRO, has served as an experimental residence for released psychiatric hospital patients. The hotel houses 180 "permanent" residents, most of whom are single, indigent, and in need of supportive services. About 85 percent have been referred to the hotel by some city agency and two thirds of these tenants have been in mental institutions. Of those with a psychiatric history, 95 percent have been diagnosed as "schizophrenic." As has been similarly found in many other New York SRO's (Shapiro 1971), much of the hotel's remaining population suffers from a wide variety of chronic medical and psychosocial problems, particularly alcoholism. Twenty persons are relatively long-term residents and have been there from 8 to 25 years; they work at full-time outside jobs and have relatively little to do with the lives of the other tenants. A small transient population, averaging 10 to 12 persons a week, pays the $10 a night rent and seldom stays more than 2 days.

The hotel is situated in a commercial zone on a congested cross-street of closely lined buildings comprising mostly wholesale importers of leather goods, restaurants, takeout shops, retail stores, and two other SRO hotels. Within a block are the major shopping areas of Fifth Avenue and Herald Square. The benches of tiny Herald Square Park, often inhabited by a derelict population, provide the closest public area for free relaxation outside the hotel. It is within a three-block radius of the Needham that most of the tenants with a psychiatric history spend the majority of their waking hours. Despite the high mobility and potential isolation engendered by the nature of the area, the hotel's location has one major advantage for the schizophrenic

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[1]Pseudonym.

tenants—there is no permanent residential population which could serve as a stigmatizing force against them. In this way, their comparatively high levels of bizarre behavior (e.g., atypical appearance, unprovoked verbal tirades, inappropriate motor activities) are generally tolerated and often go unnoticed among the passing crowds of shoppers. A survey of merchants on the hotel's block indicated that they had little knowledge of the past history of the tenants, regarding them generally as "welfare people." The one sandwich shop owner who classified Needham tenants as "psychos" has exploited them by loan-sharking practices.

Unlike 98 percent of New York's SROs, the Needham has a multiagency social service center housed in a small office and interconnecting lounge on the hotel's second floor. This center is dependent on a full-time casework coordinator and two case aides. Part-time on-site staff members include two psychiatrists, a nurse, a home health-aide, three social workers, a home economist, and a priest. A detailed description of the hotel's program and culture is provided elsewhere (Cohen, Sichel, and Berger 1977; Sokolovsky et al. 1978).

We selected this site to study the social interactions of schizophrenics because the setting allowed residents opportunities to socialize through intramural activities, and yet it was not so isolated from surroundings that it became a "back ward in the community" (Lamb and Goertzel 1971). While the selection of a hotel with on-site programs may bias the measurements of hotel contacts, it should have no significant influence on extramural linkages. Furthermore, ecological constraints in other SRO hotels without organized programs may result in portraying the ex-mental patient as unduly isolated; often, socialization is impeded because there is no common meeting area or there is a high criminal concentration.

Network Analysis

Over the past two decades, beginning with the studies by Barnes (1954) of a Norwegian parish and by Bott (1957) of a London neighborhood, the concept of a "social network" has evolved from a metaphorical term into a precisely defined analytic concept. A good definition of social networks has been provided by Mitchell (1969) who states that a network is "a specific set of linkages among a set of persons with the . . . property that the characteristics of these linkages as a whole may be used to interpret the social behavior of the persons involved" (p. 2). All social forms (e.g., institutions, events) can be studied in terms of connections among individuals, both directly and indirectly involved.

Diagrammatically, a network is similar to a communication circuit; it indicates that certain persons are in touch with one another. More significant for research and clinical applicability, the content as well as the form of the network must be delineated. That is, the nature of the transactions that flow in these channels must be established empirically. In doing this, the personal network can be understood as a support system involving the "giving and receiving of objects, services, social and emotional supports defined by the receiver and the giver as necessary or at least helpful in maintaining a style of life" (Lopata 1975, p. 35).

A number of authors have used different criteria for analyzing the complex relationships of social networks (Barnes 1972; Epstein 1961; Jay 1964; Kapferer 1969). For use here, we will distinguish between interactional and morphological characteristics of networks. To assess interactional characteristics, we have looked at the intensity, differentiating *uniplex*, or single-stranded, relations in which links represent only one type of content (e.g., visiting and conversation, personal assistance, loans) from *multiplex*, or multistranded, relationships that contain more than one content. *Directionality* will refer to the direction in which aid in a dyadic relationship flows: "instrumentally," from ego to another, "reciprocally," in equal measure between ego and another, or "dependently," from another to ego. Morphological features of networks will be measured by *size*; by *density*, which is the ratio of actual links to potential ones; and by *degree*, which is the average number of relations each person has with others in the same network. Degree has been included so as to correct for the tendency for bigger networks to produce

low-density systems because of the large number of relationships that must be generated to maintain high-density levels. Both these concepts can be expressed algebraically:

$$\text{Density} = Na/\frac{N\,(N\text{-}1)}{2} \text{ and Degree } = 2\,Na/N$$

where Na is the actual number of relations in a delimited zone (excluding ego) and N is the number of persons within the zone (excluding ego).

There are two common strategies of network research (Craven and Wellman 1973). The first of these is the "whole-network" strategy which depicts all linkages among all the units belonging to a particular interacting population. Such a strategy is most feasible in extremely small, clearly bounded populations for which a limited number of variables are investigated (cf. Killworth and Bernard 1974).

The second approach, more commonly applied to urban studies, is the "personal network" strategy (Mitchell 1969). This method involves choosing a starting unit—an individual chosen from the population—and obtaining a list of all other units to which he is linked. The major strengths of this technique are that it permits sampling from a large population and the analysis of many variables where it would prove unmanageable to study a whole network. In this study we have used the "personal network" approach.

In charting an individual's network we have combined participant observation, logs of daily activity, extensive biographical interviewing, and the use of a "network profile" questionnaire. By combining informal and formal techniques of data gathering, we attempted to avoid a methodological skewing of the data contacts in each personal network.

The network profile comprises six fields of interaction: tenant-tenant, tenant-nontenant, tenant-kin, tenant-management, tenant-staff, tenant-social institution. Within each parameter of interaction, the content of the relationship was delineated as was the frequency, intensity, and directional flow of the link. While the totality of the network profile encompasses what Jay (1964) calls the "activity field," the present analysis was concerned only with the "personal order" of relationships (Mitchell 1969). Thus,

we excluded links developed solely within the context of a formal or institutional relationship such as tenant-management, client-social worker, or patient-psychiatrist. Furthermore, only links active within the preceding year with a frequency of at least once per month were included. The resultant data yielded what Barnes (1969) refers to as a person's "first order star," in this case including all direct personal links both in the hotel and elsewhere.

Subjects

Tenants were selected for the study sample on the basis of their clinical symptoms. The presence of Bleulerian primary or secondary symptoms was used to assess degree of pathology: (a) SR group—schizophrenia with moderate or severe chronic residual symptoms; (b) S group—schizophrenia with minimal or no chronic residual symptoms; (c) NP group—those with no known psychotic history. Diagnoses were determined by a consensus of the assessments of two staff psychiatrists, a psychiatric social worker, and the predominant diagnosis in the hospital chart. Individuals were then randomly chosen to form a stratified sample of the three diagnostic types living in the hotel. Data were collected on the personal networks of one fourth of the hotel's population. Largely because the research team included on-site staff, the rejection rate for interviews was only 2 percent. No significant differences were found between the final sample population and the overall hotel population with regard to sex, ethnicity, and the proportion in each diagnostic category (tables 1 and 2). The representation of the SR group in the study sample was somewhat diminished since it was necessary to discard two interviews in which respondents were unable to complete an adequate interview. There were no discards in the other categories.

There were 25 female and 19 male respondents, with a mean age of 43 years (range: 24–66 years). The average ages of the NP, S, and SR groups were 46, 38, and 42 years, respectively. Each person had been living in the hotel for at least 10 months, the longest length of stay being 7 years

with a mean residence of 3.4 years. For the NP, S, and SR groups, the average lengths of residence were 3.5, 3.2, and 3.6 years, respectively. An equal number of persons came from lower and middle class families, and two had upper class backgrounds.

Chemotherapy (generally neuroleptics) was used extensively with individuals in the schizophrenic groups. For the SR group and two subcategories of the S group (those rehospitalized since arriving at the hotel and those not read-

mitted) 82, 100, and 82 percent, respectively, were on medication regimens.

Each of the diagnostic groups was compared for network size, density, and degree by a one-way analysis of variance followed by a Scheffé test; the validity of applying analysis of variance to a nonmeasured variable (i.e., network size) has been demonstrated by Cochran (1950). Comparisons for directionality were carried out by means of chi-square analysis with a Yates correction. The critical statistical confidence level selected was $p < .05$.

Results

Personal Networks and Psychopathology

A comparison of the hotel segments for schizophrenics with residual symptoms, schizophrenics with minimal deficits, and for those with no psychotic histories points to a progressive increase in the size of the network (table 3). Thus, persons with no psychotic histories maintained hotel networks twice the size of those with severe symptomatology ($p < .05$), while the difference between the SR group and the S group was not significant. Although there was a similar trend for the number of multiplex relationships, these differences were not statistically significant. However, these figures overlook the fact that 5

Table 1. Comparison of diagnostic categories for sample and total hotel population

Diagnostic groups	Study sample ($n = 44$)	Overall population ($n = 180$)
NP group	27%	22%
S group	48%	43%
SR group	25%	35%

Note.—No significant differences were found between expected and observed values (chi-square test).
NP group = no psychotic history; S group = schizophrenia without residual symptoms; SR group = schizophrenia with residual symptoms

Table 2. Comparison of demographic variables for sample and total hotel population

Diagnostic groups	Study sample ($n = 44$)				Overall population ($n = 180$)			
	Male	Female	White	Non-White	Male	Female	White	Non-White
NP group	50%	50%	42%	58%	51%	49%	59%	41%
S group	48%	52%	57%	43%	41%	59%	62%	38%
SR group	27%	73%	64%	36%	31%	69%	72%	28%

Note.—No significant differences were found between expected and observed values (chi-square test).
NP group = no psychotic history; S group = schizophrenia with no residual symptoms; SR group = schizophrenia with residual symptoms.

Table 3. Comparison of network size, density, and degree in the hotel

Network variables	SR group (n = 11)	S group (n = 21)	NP group (n = 12)
No. of total hotel relations	6.6[1]	9.6	13.3
No. of multiplex relations	2.0	3.7	5.8
Ratio of multiplex relations to total hotel relations, in percent	30.1	38.1	42.4
Density	.22	.21	.25
Degree	1.6	2.7	3.5

Note.—SR group = schizophrenia with residual symptoms; S group = schizophrenia without residual symptoms; NP group = no psychotic history.

[1]P < .05 as compared to NP group (one-way analysis of variance with Scheffé test).

of the 11 persons in the residual category had no multiplex relations in the hotel, whereas all individuals in the other categories except for one person (in the S group) had some multiplex linkages. The most striking differences between the three groups emerged when the factor of directionality was examined (table 6). 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.

In analyzing the structure of each group's networks, we observed that although there was little measured difference in density or degree, a trend existed toward a higher degree in the NP and S groups' networks than in the residual group. The people in the latter group's network had an average of 1.6 links, while those in the former groups averaged 2.7 and 3.5 such relationships, respectively. Therefore, it appears that the more severely schizophrenic individuals form networks with persons who are less intertwined with each other and usually have less social investment in such configurations.

In the partial personal networks outside the hotel (table 4), similar variations between the groups arose, with nearly all significant differences occurring between the NP and the SR groups. Hence, this segment of the NP group's network averaged nearly three times as many total and multiplex links as that of the SR group. As was seen in the hotel networks, the residual group showed the highest percentage of dependent links. Although not statistically significant, differences were demonstrated in instrumental links, with the residual schizophrenics being the only ones who did not form any such relationships outside of the hotel. Importantly, these differences stem from the sphere of outside non-kin linkages, in that all those partial networks involving kin members showed no important differences in size or multiplexity.

In summing up the total network segments (tables 5 and 6), we observe that the nonpsychotic individuals developed substantially larger networks and a greater number of multiplex relationships than both levels of schizophrenics. The SR group had an average of 10.3 total contacts and 4.3 multiplex relations, while the figures for the S and NP groups were 14.8/6.7 and 22.5/12.1, respectively. With respect to direc-

Table 4. Comparison of network size and multiplex relations outside the hotel

Network variables	SR group (n = 11)	S group (n = 21)	NP group (n = 12)
Kin			
No. of total relations	1.8	2.9	3.7
No. of multiplex relations	1.1	1.6	2.8
Non-kin			
No. of total relations	1.8[1]	2.3	5.5
No of multiplex relations	1.2[1]	1.4	3.6
Total outside (Kin & non-kin)			
No. of total relations	3.6[1]	5.1	9.3
No. of multiplex relations	2.3[1]	3.0	6.3

Note.—SR group = schizophrenia with residual symptoms; S group = schizophrenia without residual symptoms; NP group = no psychotic history.
[1]*P* < .05 as compared to group with no psychotic history (one-way analysis of variance with Scheffé test).

tionality, the networks of nonresidual schizophrenics contained about the same percentage of instrumental relations as those from the group without a psychotic history. Equally important, a major difference between the two levels of schizophrenics was in the greater ability of the S group to form a significantly higher percentage of instrumental linkages.

Predictors of Hospitalization

Of the 29 persons who had been hospitalized previously for psychotic illness, 17 required readmission. Those rehospitalized averaged one admission every 14 months with a mean confinement of 18 days. Symptomatology (i.e., manifesting moderate or severe levels of Bleulerian criteria) was a major factor in determining rehospitalization; 9 of 10 persons in the SR group with prior hospitalizations were readmitted during their hotel tenure, whereas only 8 of 19 in the S category were readmitted (*p* <.05). The size and multiplexity of the hotel network were also significant in differentiating between hospitalized and nonhospitalized samples; however,

Table 5. Comparison of network size and multiplex relations: Totals—hotel and outside

Relations	SR group (n = 11)	S group (n = 21)	NP group (n = 12)
No. of Total relations	10.3[1]	14.8[1]	22.5
No. of multiplex relations	4.3[2]	6.7[1]	12.1

Note.—SR group = schizophrenics with residual symptoms; S group = schizophrenia without residual symptoms; NP group = no psychotic history.
[1]*P* < .05 as compared to NP group (one-way analysis of variance with Scheffe test).
[2]*P* < .01 as compared to NP group (one-way analysis of variance with Scheffé test).

network size and multiplexity outside the hotel were not significant variables (table 7).

In order to "control" for symptomatology and thereby provide a better measure of the effect of network on recidivism, the S group was broken

Table 6. Comparisons of directionality between diagnostic groups

Directionality of relations	SR group (n = 11)	S group (n = 21)	NP group (n = 12)
Hotel Percentage of instrumental relations to total hotel relations	5.5[1,2]	17.3	13.3
Percentage of dependent relations to total hotel relations	26.0[3]	16.3	7.6
Outside Percentage of instrumental relations to total outside relations	0	7.4	11.6
Percentage of dependent relations to total outside relations	35.0[1]	23.1	15.2
Overall: Hotel & outside Percentage of instrumental relations to total relations	3.6[1,2]	12.9	13.3
Percentage of dependent relations to total relations	22.1[1]	13.9	9.6

Note.—SR group = schizophrenia with residual symptoms; S group = schizophrenia without residual symptoms; NP group = no psychotic history.

[1] $P < .05$ as compared to group with no psychotic history (chi-square test with Yates correction).

[2] $P < .05$ as compared to group with residual symptoms (chi-square test with Yates correction).

[3] $P < .01$ as compared to group with no psychotic history (chi-square test with Yates correction).

down on the basis of readmission. Within the S category, there were 8 persons who had been rehospitalized and 11 persons with no readmissions since arriving at the hotel; the mean lengths of hotel stay for these subgroups were 3.3 years and 3.1 years, respectively. The nonreadmitted S tenants were able to form nearly twice as many uniplex and multiplex linkages within the hotel as the readmitted S residents, though outside contacts failed to produce significant differences. In general, the networks of the readmitted S residents resembled the networks of the SR group (table 8).

With respect to interconnectedness (table 8), there were no differences in the density of hotel networks between groups, but higher values for degree were attained by the nonreadmitted S tenants versus the other two categories (this difference did not reach statistical significance).

These results suggest that within the networks of the nonreadmitted residents, persons were more likely to socialize with each other. An analysis of interactional data indicates that the nonhospitalized tenants had significantly more instrumental relationships both within and outside the hotel, whereas the hospitalized residents had more dependent transactions (table 9). In comparing transitivity within the S group, those without readmissions were able to engage in significantly more helping relationships intramurally and extramurally; there were no differences in levels of dependency (table 10).

Comment

The study provides partial validation for the notion of isolation among schizophrenics. In terms of overall network size, both schizophren-

ic groups had significantly smaller networks than the nonpsychotic group (table 5); the mean number of personal contacts in the NP group corresponded to the mean network size of 20–30 linkages reported for "normal" populations (Boissevain 1974; Killworth and Bernard 1974; Pattison et al. 1975).

It is important to note, however, that even the most impaired group of schizophrenics was not totally isolated; they had a mean network size of 10 persons with an average of 4 multiplex linkages. Furthermore, there was no evidence to suggest that a "back ward in the community" existed. While the SR and S tenants had considerably fewer outside contacts than the NP group, over one third of their total network consisted of nonhotel community relationships.

More importantly, only 2 of 33 schizophrenics in the sample had no outside interactions.

There were also quantitative and qualitative differences within the schizophrenic continuum that must be appreciated. The schizophrenics with residual deficits formed networks that had two thirds the number of first order linkages and nearly one half the number of multiplex relationships of the nonresidual group. The nonresidual schizophrenics also demonstrated considerably less dependent behavior and significantly more instrumental activity than the residual schizophrenic group; and their networks exhibited more connectedness (i.e., higher "degree") than those of the residual category. With respect to the directionality and the degree of their networks, the nonresidual schizophrenics

Table 7. Comparison of network variables and rehospitalization

Network variables	Persons rehospitalized since hotel arrival ($n = 17$)	Persons not rehospitalized since hotel arrival ($n = 12$[1])
Hotel		
No. of total relations[2]	5.8	11.2
No. of multiplex relations[3]	1.9	4.3
Density	.21	.20
Degree	2.9	4.0
Outside kin		
No. of total relations	2.2	3.1
No. of multiplex relations	1.1	1.9
Outside non-kin		
No. of total relations	2.0	1.9
No. of multiplex relations	1.2	1.3
Total outside		
No. of total relations	4.2	5.0
No. of multiplex relations	2.3	3.2
Hotel & outside		
No. of total relations	10.0	16.2
No. of multiplex relations	4.2	7.5

[1] Includes only persons with previous hospitalizations for psychotic illness.
[2] $P < .01$ (one-way analysis of variance).
[3] $P < .05$ (one-way analysis of variance).

Table 8. Comparison of network variables and rehospitalization for S and SR groups

Network variables	S group—not readmitted since hotel arrival ($n = 11^1$)	S group—readmitted since hotel arrival ($n = 8$)	SR group—readmitted since hotel arrival ($n = 9$)
Hotel			
No. of total relations	11.6	4.6[2]	6.9
No. of multiplex relations	4.4	1.6	2.1
Density	.20	.14	.24
Degree	2.7	0.7	1.8
Outside			
No. of total relations	5.2	4.6	3.9
No. of multiplex relations	3.4	2.0	2.5
Overall: Hotel & outside			
No. of total relations	15.6	11.8	10.8
No. of multiplex relations	7.7	4.4	4.6

Note.—S group = schizophrenia without residual symptoms; SR group = schizophrenia with residual symptoms.
[1]Includes only those persons with previous hospitalization for psychotic illness.
[2]$P < .05$ as compared to nonreadmitted S group (one-way analysis of variance with Scheffé test).

more closely resembled the nonpsychotic group. This correlated with the ability of the less severely impaired schizophrenics not only to perceive themselves as social equals of the nonpsychotic tenants, but also to be ranked as leaders by the general tenant population (Sokolovsky et al. 1978). Many persons who were labeled as schizophrenic were able to become active and important community members, even within a difficult cultural environment.

Contrary to the reports of Hammer (1963–64) and Pattison et al. (1975), we were unable to discern any differences in network interconnectivity (as measured by density) based on levels of psychopathology or rates of rehospitalization. Connectedness as calculated from the "degree" index did show some important trends in relation to symptomatology and recidivism; yet the findings were in the opposite direction of the results of Pattison et al. The non-

psychotics had the highest values, the schizophrenics without residual symptoms had intermediate values, and the schizophrenics with residual symptoms had the lowest values. Similarly, the nonreadmitted schizophrenics attained a considerably higher degree of connection than the readmitted schizophrenics. The discrepancy between these data and those of Pattison et al. is perhaps due to their failure to correct for decreasing ratios of connectivity/nonconnectivity as networks become larger; the degree index acts as such a correction device. Whether the increased cross-linkages among the healthier populations actually contributed to outcome could not be ascertained. Future research should be addressed to this question.

Finally with respect to rehospitalization rates, there were two main variables, symptomatology and hotel network size (including multiplexity). For schizophrenics with residual deficits, symp-

Table 9. Comparison of directionality and rehospitalization

Network variables	Persons hospitalized since hotel arrival ($n = 17$)	Persons not rehospital-ized since hotel arrival ($n = 12$[1])
__Hotel__		
Percentage of instrumental relations to total hotel relations[2]	4.7%	22.4%
Percentage of dependent relations to total hotel relations[2]	25.9%	9.7%
__Outside__		
Percentage of instrumental relations to total outside relations[2]	0%	13.3%
Percentage of dependent relations to total outside relations	30.6%	26.7%
__Overall:__ __Hotel & outside__		
Percentage of instumental relations to total relations[2]	2.5%	19.6%
Percentage of dependent relations to total relations[2]	28.0%	9.8%

[1] Includes only those persons with previous hospitalization for psychotic illness.
[2] $P < .01$ (chi-square test with Yates correction).

tom level was sufficient to predict rehospitalization; 90 percent of persons in this group were readmitted at least once during their hotel stay. More importantly, within the category of schizophrenics with low levels of manifest pathology, there was a subgroup of individuals who had small hotel networks and who were prone to rehospitalization. Also, it appears that the immediate hotel linkages rather than outside contacts were crucial to outcome. The type of relationships engaged in by the readmitted tenants included more dependent and fewer instrumental interactions than relationships of the nonreadmitted.residents.

Though the sample size used here was small, it can be tentatively concluded that social contacts are related to outcome of schizophrenia with minimal symptomatology, but play only an auxiliary role in the rehospitalization of more severely ill schizophrenics. Although it would logically follow that the former group benefits most from socialization activities, a definitive causal relationship between levels of social contact and rehospitalization remains to be estab-

Table 10. Comparison of directionality and rehospitalization for S group

Network variables	Persons rehospitalized since hotel arrival (n = 8)	Persons not re-hospitalized since hotel arrival (n = 11[1])
Hotel		
Percentage of instrumental relations to total hotel relations[2]	5.4%	23.4%
Percentage of dependent relations to total hotel relations	13.5%	9.4%
Outside		
Percentage of instrumental relations to total outside relations[2]	0%	14.0%
Percentage of dependent relations to total outside relations	27.9%	21.1%
Overall: Hotel & outside		
Percentage of instrumental relations to total relations[3]	2.7%	20.5%
Percentage of dependent relations to total relations	20.3%	13.0%

Note.—S group = schizophrenia without residual symptoms.
[1]Includes only those persons with previous hospitalizations for psychotic illness.
[2]$P < .01$ (chi-square test with Yates correction).
[3]$P < .05$ (chi-square test with Yates correction).

lished. The data suggest that hotel networks acted to obviate readmission, but it can also be argued that hospitalization somehow resulted in reduced network size. Frequency or length of hospitalization seems unlikely to have created this social withdrawal, however, since hospitalizations occurred on the average of every 14 months with a mean stay of 18 days. Nevertheless, it is possible that there may be some social stigma attached to readmission, irrespective of its infrequency and brevity. More definitive conclusions about network effects must await the completion of longitudinal studies that examine the influence of network flux on hospitalization rates and outcome measures.

Over the past few years we have commonly observed evidence of the prophylactic effects of the social support system on rehospitalization. The following vignette illustrates such effects on a young man who had been classified in the schizophrenia group with minimal chronic residual symptomatology.

A. H. is a 28-year-old Puerto Rican male who arrived at the hotel in 1971. During his first 3

years at the Needham he was hospitalized every 3–6 months for catatonic schizophrenic episodes. Despite all therapeutic efforts by staff (e.g., encouraging medications, additional therapy during periods of stress) there was no significant change in the rate of readmission. At that time, he had few contacts at the hotel and his principal social linkages were at his mother's home, where he frequently encountered stress and tension. In 1974, he began to participate in a tenant cluster dominated by Mr. J. R. The immediate effect of his participation was that group support was able to prevent A. H. from easily isolating himself; he was then able to remain out of the hospital for 9 months. Later that year, he began eating supper with Ms. E. M. to whom he would pay monthly supper money. This enabled him to avoid anxiety-provoking visits to his mother's house for dinner. Eating with Ms. E. M. he made friends with Mr. M. A., who was a leader of another hotel cluster. By participating in two clusters A. H. was able to receive continuous tenant support despite periods when one or the other cluster was inoperable due to the temporary absence of leaders. By using the indigenous network A. H. remained out of the hospital for more than a year; in addition, group members assisted him in obtaining occasional jobs. In an effort to establish more self-sufficiency, A. H. and J. R. moved away from the hotel. When J. R. departed several months later, A.H. was again alone and rehospitalization soon followed.

For schizophrenics with moderate and severe residual symptoms quantitative features of the hotel network do not play a major role in outcome. However, qualitative aspects of the network may be of prime importance. In instances in which individuals from this diagnostic category avoided readmission, we frequently observed that their networks were able to provide services necessary for survival in the community (e.g., medication, food, money). Furthermore, because of the fragility of many of their linkages, longevity in the community was further enhanced by the presence of a flexible network structure. The following case illustrates these points:

Mr. B., a 55-year-old white male with minimal residual schizophrenic symptoms, was the focal point for six sicker tenants who relied on him for a spectrum of services such as meals, medication, negotiating the welfare system, budgeting, and the like. One tenant, Ms. O., a 69-year old woman with a history of frequent hospitalizations for chronic schizophrenia, paid Mr. B. to provide her with three meals per day. Mr. B. also made certain that she took her medication and maintained her hygiene. This arrangement enabled Ms. O. to remain out of the hospital for more than a year. Mr. R., a 32-year-old Hispanic male with multiple hospitalizations for chronic schizophrenia, similarly depended on Mr. B. for food, medication, and budgeting. During the incipient stages of an acute paranoid schizophrenic episode, Mr. B. abruptly left the hotel. Within several days, Ms. O. had mentally and physically deteriorated to the point that hospitalization was instituted. However, Mr. R.'s condition remained stable as he was able to enlist two other persons in his network to furnish the necessary assistance.

Merely comparing Ms. O. and Mr. R. on the basis of levels of psychopathology would have been insufficient to predict rehospitalization. Yet, if we had examined network structure before this episode, it would have been apparent that Ms. O. had only one personal contact available (Mr. B.) whereas Mr. R. had two linkages in addition to the one with Mr. B. For both Ms. O. and Mr. R. the presence of a network as a support system was necessary for them to remain in the community; but additionally, Mr. R. had an alternative pathway of aid that offered protection against network disruptions.

Summary

A high level of social contacts has been recognized as one of the main predictors of outcome in schizophrenia. However, a variety of issues concerning the sociability of schizophrenics still need to be clarified. Focusing on ex-mental patients residing in a large Manhattan hotel, an analysis is made of the relationship between several social network variables, psychopathology, and rehospitalization. The findings indicate that: (1) Schizophrenics have significantly fewer linkages than nonpsychotics, but even the most

impaired schizophrenics are not totally isolated. (2) Within the schizophrenic spectrum there are differences with respect to network size, complexity, directionality, and interconnectedness. (3) Rehospitalization is dependent upon two factors, degree of psychopathology and hotel network size.

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