Life Events, Familial Stress, and Coping in the Developmental Course of Schizophrenia

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Abstract

Recent studies have isolated some socioenvironmental factors that seem to predict the onset of schizophrenic episodes in vulnerable persons. In particular, stressful life events have been found to cluster in the 3- to 4-week period preceding a schizophrenic episode in some patients. Many persons with a schizophrenic disorder also seem to contribute to additional stressful life change events—for example, by high geographic mobility—thereby playing an active role in precipitating the onset of illness episodes.

Within the family environment, hostile, critical, and emotionally overinvolved attitudes toward the patient by relatives have been found to be related to relapses. Irregularities in the communication style of parents also predict the subsequent development of schizophrenia spectrum disorders among disturbed adolescents.

Many schizophrenic patients also seem to be deficient in the coping skills required to remediate the losses brought on by life events or to deal effectively with stressful relatives. Thus, they may experience greater and more prolonged stress than most others due partially to inadequate social and problem-solving skills and less supportive social networks. These findings have important implications for the design of clinical interventions as well as the development of a comprehensive vulnerability/stress model for the course of schizophrenic disorders.

While many early theorists, such as Kraepelin (1919), regarded schizophrenia as a biological disorder of entirely endogenous origin, research over the past 30 years has documented several socioenvironmental factors that affect the course of the illness. Genetic predisposition has been clearly determined to be a major contributing factor in the development of schizophrenia (Gottesman and Shields 1976; Kessler 1980). Yet the concordance rate for schizophrenia among identical twins has been found to be only about 50 percent, suggesting that genetic factors, while very important, are not sufficient causes (Shields and Gottesman 1972; Gottesman and Shields 1976). Furthermore, the waxing and waning of psychotic symptoms that characterizes the course of schizophrenia in many patients is unlikely to be due totally to genetic influences (Zubin and Spring 1977; M. Bleuler 1978). A more complete understanding of the development and course of schizophrenic disorder has been sought in studies of various intrafamilial, interpersonal, and sociocultural factors as well as in studies of intrauterine, nutritional, and other biological factors. This article reviews the principal findings concerning the impact of life events and familial stress on the course of schizophrenic disorder. These are stressors which, when they occur to individuals with a sufficient vulnerability to schizophrenia, seem to be capable of triggering a schizophrenic episode. The article also reviews selected research with normal individuals, and patients with other disorders that has revealed an intervening factor which plays a major role in determining the stress level resulting from exposure to stressors: the person’s coping response to the stressor. Investigators in the life events and familial stress areas have begun to examine the mediating effect of coping responses...
and social support on stress and on the likelihood of developing pathology after being exposed to stressors.

The findings on life events, familial stress, and coping responses are reviewed in three separate sections and are presented within the framework of a vulnerability/stress model of the course of schizophrenic disorder (Rosenthal 1970; Zubin and Spring 1977). In addition to reviewing studies bearing on the relationship between stress and schizophrenia, this examination of the literature highlights the broadened understanding of schizophrenic disorder generated by these more narrowly focused inquiries.

**Background of Research on Life Events and Schizophrenic Episodes**

The hypothesis that emotional conflicts related to external events can precipitate mental illnesses was first formally suggested by Heinroth in 1818 in his designation of the term “psychosomatic.” However, during the late 19th and early 20th centuries when schizophrenia was being delineated from other mental illnesses, medicine was dominated by Virchow and Pasteur’s theory of the “specific cause of disease.” Schizophrenia was considered to be solely a brain disease, and the etiology was sought in brain dissections to uncover anatomical abnormalities and in laboratory assays to isolate pathogens. Social and psychological factors were largely ignored. Modern versions of this perspective are represented by Langfeldt (1956), Schneider (1959), and Mayer-Gross, Slater, and Roth (1969), who maintain that external factors such as life stress do not play a causal role in “true” schizophrenia.

Jung (1907) was one of the earliest proponents of the “psychogenesis of mental disease,” and Bleuler (1911, translated 1950) also considered life situations and emotional conflicts as causal factors in the onset of at least some cases of schizophrenia. Adolf Meyer’s (1951) technique of life charts promoted the linking of life events and illness onset by tracking each on separate time lines which could be overlaid and examined. Situations he considered important to note included:

- the changes of habitat, of school entrance, graduations or changes, or failures; the various “jobs”; the dates of possibly important births and deaths in the family; and other fundamentally important environmental incidents. [Meyer 1951, p. 53]

Rather than bizarre or catastrophic events, these are events to which everyone is exposed over the course of a lifetime. Meyer argued that even such ordinary events can contribute to the development of a pathological condition.

In the early 1960s, Rahe and Holmes began developing a life events schedule based upon findings from over 5,000 of Meyer’s “life charts” taken on patients at the University of Washington. Each item selected for their Schedule of Recent Experience was included because it was found to have occurred in a large number of patients preceding the onset of their illness. Holmes and Rahe (1967) also developed the Social Readjustment Rating Scale by assigning weights for events of different judged severity from the Schedule of Recent Experience. Elevated scores on the Social Readjustment Rating Scale have been associated with the onset of numerous medical disorders including diabetes mellitus, rheumatoid arthritis, pregnancy complications, cardiovascular disease, stroke, and hospitalization for any medical reason (Rahe and Arthur 1978). It has also been used extensively in studies of the onset of psychiatric disorder including schizophrenia, depression, and suicide attempts.

Spring and Coons (1982) have described aptly the advantage of using an objective metric for the assessment of stressors in research on schizophrenic disorder:

Defining stress in terms of objectively specifiable life events is a first step in operationalizing stress independently from schizophrenia. At least this strategy attempts to disentangle the independent variable from the welter of disturbances in arousal, disruptions in coping, cognitive eccentricities and peculiarities of lifestyle that are known to be associated with the dependent variable. [p. 36]

However, despite the advance represented by the development of life events scales, there are still many methodological difficulties inherent in investigating the relationship of life events to the onset of illness. An in-depth discussion of the unique conceptual and methodological problems encountered in life events research on schizophrenia has recently been presented by Spring and Coons (1982). Furthermore, Rabkin’s (1980) review of all of the controlled studies on life events and schizophrenia focuses on research design issues such as diagnostic rigor, definition and measurement procedures for life events, appropriate time periods for events, and choice of comparison groups. The methodology of each study is individually critiqued. Because of the availability of these two thorough critiques, methodological questions are addressed only indirectly in this article. This section on life events examines the published controlled studies on life events and the onset of
Studies of Life Events and Schizophrenic Disorder

The research examining the relationship between life events and the onset of schizophrenic episodes can be divided into three groups. Type I: Some studies have found a significant increase in "independent" life events preceding the onset of psychotic symptoms, suggesting that they may play a major triggering role for episodes. Type II: Other studies have found an increase in life events before onset, but the occurrence of the life events was not independent of the influence of the patient's behavior. Nonindependent life events such as being fired from a job may reflect the prodromal period of the illness or an ongoing schizophrenic process. Zubin and Spring (1977) have labeled the processes by which schizophrenic patients often bring an excess of life events upon themselves as "stress-prone patterns of living." Type III: The third set of studies in the literature report no relationship between life events and the onset of schizophrenic episodes. The existing research on life events and schizophrenia is reviewed within the framework of these three patterns with an emphasis on the characteristics of the circumstances and patient subgroups to which these three patterns seem to apply.

Type I: Major Triggering Role. Of the three types of relationships between life events and schizophrenic episodes, the pattern of an increase in independent life events preceding the onset of a schizophrenic episode provides the most substantial support for the vulnerability/stress model. Although the issue of "independence" of life events and personal behavior is a thorny one (to be discussed further) and the criteria for establishing such independence have varied across studies, all of the studies reviewed in this section have attempted to isolate events which are not confounded with the onset of a schizophrenic episode.

Brown, Harris, and Peto (1973) introduced the term "formative" to describe situations in which "events play an important formative role and the onset is either substantially advanced in time by the event or brought about by it altogether" (p. 162). The study that is most often cited to illustrate that life events can have such a formative role in a schizophrenic episode is that of Brown and Birley (1968). The authors conducted extensive retrospective interviews with patients hospitalized for a schizophrenic episode and with their relatives to elicit life events in the 13 weeks before the onset of illness. Independent life events were defined as ones not brought on by the "unusual" behavior of the patient or planned by the patient at least 3 months ahead. Brown and Birley found that 46 percent of the schizophrenic patients experienced at least one independent life event in the 3-week period before symptom onset, while only 14 percent of the normal community comparison subjects experienced such an event in the 3 weeks before the interview. The number of independent life events during the full 13-week period did not differ significantly between the two groups. Thus, schizophrenic patients showed a significant increase in independent life events clustering in the 3-week period before symptom onset.

Brown and Birley eliminated from the study 60 percent of the schizophrenic patients admitted to the hospital because the onset of their symptoms could not be dated within 1 week. Therefore, these findings can only be generalized to the segment of the schizophrenic population whose course of illness is characterized by the acute appearance of symptoms. Even within this subgroup among whom a statistically significant relationship between independent life events and onset was found, Brown, Harris, and Peto (1973) argue that ongoing difficulties and tense situations at home or at work or in a key relationship also played a major role in episode onset in most cases. They introduced the term that we have adopted here, "triggering," to identify situations in which "events are seen as precipitating an illness that would probably have occurred before long for other reasons" (Brown, Harris, and Peto 1973, p. 159). However, when events in the Brown and Birley study were rated on a four-point scale of severity of threatening implications, 16 percent of schizophrenic patients experienced a markedly threatening event in the 12 weeks before onset, which was three times the incidence for the controls. This finding suggests that for at least a minority of datable-onset schizophrenic patients (16 percent of the 40 percent of schizophrenic hospital admissions who were included in the study) "events may be sufficiently traumatic to bring about onset without the experience of such [ongoing difficult] situations" (Brown, Harris, and Peto 1973, p. 169).

Maintenance antipsychotic medication appears to influence the likelihood that a schizophrenic patient will have a triggering life event before relapse. Leff et al. (1973) found that independent life events preceded relapse significantly more often among patients on
expressed emotion (EE) in families of being associated with relapse events seem to play a triggering role in the onset of a schizophrenic episode. This research is reviewed in detail in the Familial Stress section of this article.

Another factor that influences the relationship between medication status and life events among their sample of schizophrenic patients. Although the difference was not statistically significant, 60 percent (3 of 5) of the patients on medications reported an independent life event before onset, whereas only 31 percent (4 of 13) of the patients who were not on medication reported an event. The interpretation of Birley and Brown's (1970) results is restricted by the small sample size and by a self-selection bias regarding medication status. However, the Leff et al. (1973) study included 116 patients, controlled for medication status by random assignment, and did demonstrate a significantly different rate of prerelapse life events for on-drug and placebo groups. Thus, these two studies identify a subgroup—namely, patients on maintenance antipsychotic medication—among whom life events seem to play a triggering role in the onset of a schizophrenic episode.

Another factor that influences the likelihood of independent life events being associated with relapse emerged from the British research on expressed emotion (EE) in families of schizophrenic patients. Leff and Vaughn (1980) found that recently hospitalized schizophrenic patients from low EE families were significantly more likely to have experienced an independent life event in the 3 weeks preceding illness onset (56 percent) than were the patients from high EE families (5 percent). High EE families seem to produce stress sufficient to obviate the need for additional stressful life events in the generation of a relapse. However, among patients living in low EE environments, life events do seem to play a triggering role in the onset of episodes. This research is reviewed in detail in the Familial Stress section of this article.

Another strategy for investigating the relationship between a significant change in psychosocial environment and the onset of schizophrenic episodes has been to examine the effect of a particularly stressful life event occurring for an entire population. An inadvertently stressful life event was created for a group of schizophrenic outpatients by Goldberg et al. (1977) during their study on major role therapy (MRT) in aftercare treatment. MRT was designed to help the patient become established in some societal role such as student, worker, or housewife. The assignment to MRT treatment can be considered an independent life event since it was outside of the patient's control. To the researchers' surprise, when they examined the interaction between relapse and level of symptomatology, they found that "in patients at the 'good' pole of the [symptom] scale, MRT forestalls relapse, but for patients at the 'bad' pole, MRT surprisingly hastens relapse" (Goldberg et al. 1977, p. 178). The authors hypothesized that "symptomatic patients getting MRT are encouraged to perform at a level beyond their capacity, resulting in social failure, a flight to the sick role, and psychotic exacerbation" (Goldberg et al. 1977, p. 184). This same process of symptomatic exacerbation in response to treatment had been observed by George Brown and his colleagues in an earlier study:

Too enthusiastic attempts at reactivating unprepared long stay patients have been shown to lead to sudden relapse of symptoms that had not been present for years. [Brown, Birley, and Wing 1972, p. 256]

In another study examining the effects of a stressful event common to an entire population, Steinberg and Durell (1968) checked the service records of every uncommissioned soldier in the U.S. Army who was hospitalized for schizophrenia from 1956 to 1960. They found that the rate of hospitalization during the early months of military service was significantly higher than during the second year. During the first month, the rate of hospitalization was six times that of the second year. Army enlistment would reflect individual choice, but induction into the Army among draftees is a stressful event clearly independent of the individual's behavior. Among draftees, the differential rate of hospitalization during the first month was even higher: eight times that of the second year. A review of the case records indicated the following:

Early detection of chronic cases probably accounts for only a very small part of the differential rate, and ... the findings therefore represent a genuine increase in the rate of onset of acute schizophrenic symptoms during the early months of service. [Steinberg and Durell 1968, p. 1104]

Some of the cases in this study would probably meet DSM-III criteria for schizophreniform disorder rather than schizophrenic disorder (American Psychiatric Association 1980). However, it is unlikely that
schizophreniform disorders account for all of the relationship.

Wagner's (1946) figures for the population at risk during the 2 months of heavy fighting at Normandy indicated an elevated incidence of cases of psychosis and cases diagnosed as schizophrenia during the combat period. It is noteworthy that Swank (1949) maintains that soldiers selected for combat duty, such as the Normandy campaign that served as the stressor for his study, had shown themselves to be of better than average stability. They had passed training tests including induction, overseas assignment, battle simulation, and had participated in prior combat situations. The description of war by Grinker and Spiegel (1963) as a "laboratory which manufactures psychological dysfunction" (p. vii) in previously normal persons seems apt as a description of the findings of these studies. Although differences in diagnostic criteria used 30-40 years ago diminish the interpretability of these combat studies, there was a general awareness of the transient nature of "3-day psychoses" (Kolb 1973). The diagnosis of schizophrenia was not routinely assigned to cases with psychotic symptoms. Only 3 percent of patients admitted to exhaustion centers as neuropsychiatric casualties were diagnosed as psychotic at time of discharge (Wagner 1946).

Dohrenwend (1979) reviewed the relationship between psychotic episodes and stressful events such as combat and natural or manmade disasters, which he termed "extreme situations." He concluded as follows:

"...the stressful experience began. [Dohrenwend 1979, p. 4]

Although not conclusively related to narrowly defined schizophrenia, these findings represent another methodological window for examining the relationship between life events outside of the individual's control and the onset of symptoms considered characteristic of schizophrenia.

Harder et al. (1980) measured life events that occurred to 217 first-admission psychiatric patients. Only 35 patients in their sample received a DSM-II diagnosis of schizophrenia (American Psychiatric Association 1968). They used a version of the Social Readjustment Rating Scale (Holmes and Rahe 1967) containing independent events only and assessed events over five time periods before admission: an entire year, 7-12 months, 3-6 months, 0-3 months, and 1 month. In their sample, level of stress was not related to severity of psychotic symptomatology, but "more severe levels of schizophrenic and general psychotic symptoms were associated with increases in life-event stress in the 12 weeks before admission" (Harder et al. 1980, p. 176). While the inclusion of patients with differing diagnoses limits the applicability of these findings to schizophrenic disorders, the results of this study point to an important issue in unraveling the relationship between life events and schizophrenic episodes. The Harder et al. (1980) study and other studies (Schwartz and Myers 1977; Uhlenhuth and Paykel 1973) have found that level of stress has its strongest impact on nonpsychotic symptoms such as anxiety and depression. However, psychotic symptoms may be particularly affected by increases in stress level shortly before exacerbation. With the exception of the Brown and Birley (1968) study, which also found an increase in life events immediately preceding onset, most life events studies have not been designed to detect changes in the level of stress in the weeks immediately preceding the development of a schizophrenic episode. The results of the Brown and Birley (1968) and Harder et al. (1980) studies, however, suggest that increases in life event stress level during the preceding few weeks rather than overall level of stress may be the most important triggering factor.

Summary. This group of studies has shown that independent life events are associated with the onset of schizophrenic episodes among selected subgroups of schizophrenic patients. This relationship has been documented particularly for patients on antipsychotic medication and patients from low expressed emotion families. Large-scale studies of "naturalistic stressors" have shown that highly stressful life events such as induction into the Army and combat also seem capable of producing an increased incidence of schizophrenic episodes in the exposed population.

Studies finding that life events play a triggering role in schizophrenic episodes fit a simple version of the vulnerability/stress model. In this model, independent life events function as external stressors which raise a person's stress level. If the level of stress exceeds the threshold for schizophrenic episodes associated with the person's vulnerability level, an episode of psychotic symptoms is precipitated. However, the studies reviewed in this section represent a minority of the studies conducted on this topic. The other two types of relationships between life events and schizophrenic episodes have somewhat different implications for the vulnerability/stress model.
Type II: Stress-Prone Patterns of Living. Many studies have found an increase in life events preceding the onset of schizophrenic illness, but the events are not clearly independent from the influence of the illness. As virtually all life events researchers have pointed out, the finding of an increase in life events before an illness does not necessarily indicate a causal role for the life events. Several characteristics of schizophrenic disorders may contribute to the clustering of events around the time of onset. Both the symptoms of schizophrenia and the unusual goals and lifestyles of persons with schizophrenia can contribute to the occurrence of life events, which may, in turn, exacerbate the psychopathology. In addition, schizophrenic patients may be more frequent victims of both independent and nonindependent life events than the average person due to hereditary and socioeconomic factors. Studies that have found this Type II relationship between life events and schizophrenic episodes are reviewed first, followed by studies that have depicted specific aspects of the stress-prone lifestyle of schizophrenic patients.

Life event studies. Studies which have compared the frequency of occurrence of stressful life events among schizophrenic patients before a hospitalization with that of community controls and with that of nonhospitalized schizophrenic patients have consistently found a greater incidence of life events for the hospitalized patients. In the Brown and Birley (1968) study reviewed earlier which found an increase in independent life events in the 3-week period before symptom onset, patients also reported nearly twice as many total events (independent and nonindependent) as community controls during the previous 13-week period: 1.74 vs. 0.96. Similarly, Jacobs and Myers (1976), in their interviews of 62 first-admission patients and 62 community control subjects matched for age, sex, marital status, race, and social class, found significantly more total life events for the previous year among the patients: 3.2 vs. 2.1. However, Jacobs and Myers did not find a significant difference between the patients and control subjects when only independent life events were considered. As mentioned in the discussion of the Harder et al. (1980) study in the previous section, the use of a time period of 1 year may overlook increases which cluster in the few weeks preceding onset of a schizophrenic episode.

In two studies, schizophrenic patients who relapsed reported significantly more total life events before hospitalization than schizophrenic patients who survived in the community. Using a prospective design, Michaux et al. (1967) compared the 1-month period before hospitalization for patients who received a functional psychiatric diagnosis, mainly schizophrenia, with that of matched community controls. They found that the relapsed patients reported significantly more "difficulties" in the six areas of functioning assessed: interpersonal, marital and sexual, economic and domestic, occupational, recreational, and health. The Specific Stress Index interview focused on the occurrence of discrete events (e.g., "Has anything happened on your job or with the people you work with?") rather than on ongoing difficulties, thereby making these results relevant to this review of life events research.

Leff et al. (1973) found that patients in the active drug condition also conformed to this pattern. The patients with a relapse were significantly more likely to have experienced a stressful life event (independent or nonindependent) in the 5 weeks preceding hospitalization than the patients without a relapse: 89 vs. 27 percent. As with the Brown and Birley (1968) study, the patients with a relapse also had a significantly higher incidence of independent life events, but at a lower rate: 44 vs. 13 percent.

Dohrenwend (1974) compared life events among five groups, including psychiatric inpatients, a representative community sample, and a group of community leaders. Life events were categorized into eight types ranging from "direct manifestations of psychiatric or emotional disturbance" to "objective loss events . . . whose occurrence is likely to be outside of the respondent's control." (pp. 18-19). The patients showed a significantly higher rate of loss events for which they may have been responsible than the community samples. Dohrenwend also found that psychiatrists' ratings on an index of severity of disorder were positively related to the likelihood that events reported were consequences of the subject's psychiatric condition. In a later article reviewing this study, Dohrenwend and Dohrenwend (1980) commented:

"It seems clear from these results that, to some extent, the stressful events accompanying psychopathology are a function of this proneness of the individual involved. [p. 191]"

Fontana et al. (1972) distinguished whether the life events which occurred to a sample of hospitalized psychiatric patients and community controls were contingent (nonindependent) or noncontingent (independent). These investigators also found that during the previous year, "patients had significantly more events of the type they had a part in bringing about than controls had in total" (Fontana et al. 1972, p. 118).
The number of noncontingent events did not differ from the controls. Again, the use of a 1-year time period may have obscured any increases in independent life events in the weeks preceding a relapse (Harder et al. 1980).

The applicability of the Dohrenwend (1974) and the Fontana et al. (1972) findings to schizophrenic disorder is unclear, unfortunately, due to a lack of diagnostic specification in both studies. The diagnoses of the inpatients in Dohrenwend’s (1974) study are not reported, and Fontana et al. (1972) recruited their sample from consecutive admissions to a hospital including an unreported mixture of DSM-II psychotic, neu/rtic, and personality disorder diagnoses.

A novel research strategy has recently been used by Falloon et al. (1981) in their prospective study of the relationship between fluctuations in patients’ level of symptomatology and the occurrence of life events. Both life events and symptom data were collected every 2 weeks over a 1- to 2-year period for 23 schizophrenic patients who were in outpatient treatment. Data on the occurrence of events were collected from relatives using a semistructured interview and the events were then assigned Social Readjustment Rating Scale scores (Holmes and Rahe 1967). The period of highest and lowest symptomatology for each patient was compared to determine whether there was a significant difference in life event scores during the preceding 3-month interval. Somewhat higher Social Readjustment scores were found in each of the 3 months preceding the point of highest symptomatology, particularly in the month closest to exacerbation (15.0 vs. 11.6). Although preliminary analyses of the as yet unpublished data suggest that this trend may not be statistically significant, more definitive analyses, using the scoring methodology of Brown and Birley (1968), are underway.

Thus, both prospective and retrospective studies have shown that an increase in life events is associated with the onset of schizophrenic episodes. Comparisons of patients with a recent episode to community controls, nonhospitalized schizophrenic patients, and to themselves at a point of nonexacerbation argue strongly that the course of schizophrenia is associated with the frequency of occurrence of life events. However, since the studies reviewed in this section involve life events which are not clearly independent of the patient’s behavior, this association cannot be considered to demonstrate a simple causal link. Other factors which have been found to affect the nature of the relationship between life events and schizophrenic episodes are discussed next.

Stress-prone factors: Prodromal and residual symptoms. Many of the life events included in the popularly used scales can be manifestations of the early phase of a schizophrenic episode rather than events which fatefuly befall a person. For example, the Holmes and Rahe (1967) Schedule of Recent Experience includes items such as “major changes in number of arguments with spouse,” “major changes in sleeping habits,” “divorce,” and “being fired from work,” which are difficult to disentangle from the onset of schizophrenic symptoms. In the Jacobs and Myers (1976) study, most of the six events which discriminated patients from normals at the .05 level of statistical significance could have been confounded with the onset of the schizophrenic episode, i.e., being arrested, court appearance, trouble with boss, and changes of residence. Similarly, in the Brown and Birley (1968) study, 40 percent of the schizophrenic patients were involved in legal proceedings, made moves from one region to another, or changed jobs within the 13-week period preceding the episode. Such stressful events expose patients to loss of social support, but they could also be secondary consequences of the early phase of symptomatic exacerbation. As noted earlier, one strategy used by Brown and Birley (1968) to avoid confounding symptoms with the occurrence of life events was to restrict their sample to patients for whom the onset of the psychotic symptoms could be dated within a 1-week period. However, the resulting elimination of 60 percent of their sample of consecutive admissions indicates that this technique may entail a reduction in the extent to which the findings generalize to the schizophrenic population as a whole.

This difficulty is not merely a function of methodological problems that could be overcome with more precise dating procedures. Schizophrenia has classically been associated with “insidious onset” (Kraepelin 1919). In a recent study of first-admission schizophrenic patients, only 28 percent had psychotic symptoms for less than 1 week before hospitalization. Twenty-nine percent had experienced some psychotic symptoms for more than 6 months (Gift et al. 1981). When psychotic symptoms do not appear acutely, defining onset is basically arbitrary. Definite markers of the beginning of schizophrenic episodes do not exist, and patients can waver between prodromal and psychotic symptoms for long periods. Many of the prodromal and residual symptoms listed as part of the DSM-III duration criterion for the diagnosis of schizophrenia, such as markedly peculiar behavior, bizarre...
ideation, and perceptual abnormalities, are difficult to distinguish clinically from more florid psychotic symptoms such as delusions and hallucinations which characterize a schizophrenic episode. As Spring and Coons (1982) have pointed out:

In psychopathology research, the problem of dating onset of schizophrenia is often treated as a methodological pitfall to be circumvented by improving inter-rater agreement. In actuality, it is a conceptual problem. Schizophrenia is a disorder which may develop by gradual accretion. It is difficult to determine when behavioral eccentricities have passed the threshold into a paranoid or schizoid personality, when these have shaded into a prodromal syndrome, and when this in turn has met the criteria for frank psychosis. (p. 110)

In addition to the difficulties of dating the onset of psychosis, there are other formidable methodological and conceptual problems in determining whether the occurrence of life events is independent of the influence of the illness. For example, Brown and Birley (1968) eliminated events brought on by the unusual behavior of the individual. Yet events which are not influenced by behavior that is grossly unusual can still be influenced by underlying vulnerability or prodromal symptoms. Jacobs and Myers (1976) used the criterion that "fateful" events be "independent of the person's ability to influence them" (p. 78). Harder et al. (1980) eliminated eight events which they judged as very likely to be consequences of psychiatric disorder from the 43-item Schedule of Recent Experience (Holmes and Rahe 1967) and also probed for the circumstances surrounding events to determine if they were the result of the patient's pathological condition. Yet, when Spring and Coons (1982) compared the lists of events which the studies of Dohrenwend et al. (1978), Dohrenwend (1974), Jacobs and Myers (1976), and Schwartz and Myers (1977) designated as independent, they found that the only events the researchers agreed upon were those concerning deaths. Zubin and Spring (1977) have pointed out that the domain of independent events is actually quite small:

With the exception of such natural calamities as earthquakes, it may be that a person's choice of lifestyle contributes to his likelihood of encountering stressful events. (p. 110)

Dohrenwend (1974) found that many psychiatric patients, when asked about the last major event that changed their activities, reported events specifically related to their psychiatric illness or treatment.

There is evidence that, as early as in infancy and childhood, persons who later develop schizophrenia engage disproportionately in behavior patterns which might enhance the occurrence of stressful life events. For example, in a prospective longitudinal study of children of schizophrenic mothers, differences between individuals diagnosed as exhibiting "schizophrenia spectrum" disorders versus those not showing signs of any mental disorder were detectable before the age of 2 (Parnas et al. 1982). The future schizophrenia spectrum babies were more passive and had poorer attention span at play. During the school years, they were described as having had more interpersonal difficulties, as exhibiting difficult, unusual behavior, and as being disciplinary problems. In two retrospective studies using school records, a significantly larger proportion of preschizophrenic boys than controls showed poor school performance, emotional instability, and disagreeableness. The preschizophrenic girls in the study were rated as emotionally unstable, introverted, and passive (Watt et al. 1970; Watt 1978). Thus, aspects of the vulnerability to schizophrenia may be associated with behaviors which increase the likelihood of stressful interpersonal difficulties on an ongoing basis. As with dating onset, the difficulties in separating life events from manifestations of the illness point to an important aspect of the relationship between stress and the onset of schizophrenic episodes rather than a methodological difficulty to be surmounted.

Stress-prone factors: Goal-directed pursuit of life events and hospitalization. Some researchers have emphasized the active and willful participation of schizophrenics in creating life events. For example, Leff (1976), in his review of geographic mobility among schizophrenics before their first episode, highlighted the goal-directedness of life events connected with changes in residence. He concluded that the pursuit of social isolation was the major motivating factor in such relocations. Jacobs and Myers (1976) found more relocations among schizophrenic patients in the year preceding a relapse than among controls. Schwartz and Myers (1977) also found a higher incidence of social exits among schizophrenic ex-patients living in the community than among controls, suggesting that the pursuit of social isolation is a continuing component of schizophrenic behavior. These findings point to the participation of schizophrenic patients in creating the disruptions in their social support systems that are considered a core aspect of the stressfulness of many life events.

In the Fontana et al. (1972) study of hospitalized patients, the authors viewed contingent (nonindependent)
events preceding hospitalization, such as changing residence, angry outbursts, being arrested, withdrawing, and hospitalization itself, as "attempts to negotiate changes in others' expectations" (p. 311). Such events may serve to recruit physical support and psychological gratification, enable the patient to flee an unpleasant situation by ensuring hospitalization, or publicly demonstrate that pressures have precipitated a "nervous breakdown." Even when the behavior is not consciously planned and appears grossly disordered, Fontana et al. (1972) maintain that "adopting an instrumental view of the behavior and of hospitalization will increase our understanding of both" (p. 311).

In another study addressing the motivational dimension of illness behavior, Lewis and Hugi (1981) examined the changes in utilization of mental hospitals by patients during the last 20 years of deinstitutionalization. Before the 1960s, psychiatric patients typically spent long periods of time confined to hospitals. However, the authors maintain that:

The contemporary world of the mental patient, we believe, looks and feels very different than it did a generation ago . . . . The present system is a mosaic of services and funding modalities which emphasize the voluntary nature of assuming the mental patient role. [Lewis and Hugi 1981, p. 208]

Lewis and Hugi found that most of their sample of 18 chronically treated patients (no diagnoses reported) lacked jobs, families, and adequate income. Hospitalization was one of the resources that they had available in their limited social network to replace or supplement families, friends, and jobs. From their interviews with these 18 patients, the authors concluded:

The continued use of inpatient facilities reflects . . . purposeful behavior of resource-poor citizens who can avail themselves of these situations when they feel it is necessary . . . a "weekend retreat" for those who have few other places to go. [p. 218]

For example, one patient in their study stated: "It's like a vacation. I like it" (Lewis and Hugi 1981, p. 216).

The use of psychiatric hospitals to recruit basic material and social resources instead of as treatment centers for relieving psychopathology is a possible confounding factor in the basic paradigm being used by researchers in the life events area. It raises the possibility that the life events preceding the onset of a schizophrenic episode might have been motivated by the desire to gain access to the hospital. Unfortunately, none of the studies adopting this perspective have provided data indicating what proportion of life events or hospitalizations is attributable to motivated behavior.

By restricting their research to case examples and not subjecting their model to empirical verification by operationally defining "purposive" and "instrumental" behavior, the proponents of this position overgeneralize the social perspective. Validation of their approach will require a stronger empirical foundation. Thus, the relevance of goal-directed life events to the onset of schizophrenic episodes awaits clarification.

Another manner in which some patients may actively contribute to an increase in stressful life events and psychotic symptoms has been isolated by Van Putten, Crompton, and Yale (1976). They identified a group of schizophrenic patients who "seem to prefer psychosis to a drug-induced normality" (p. 1443). Their study compared a group of habitual drug refusers, who invariably discontinued antipsychotic medication and were repeatedly hospitalized afterward, with a group of drug compliers. While many factors associated with drug compliance have been identified—e.g., side effects, complexity of regimens, insight into illness, and severity of illness—these did not account for the difference in rate of drug compliance between the two groups. The variable that provided the most powerful discrimination of the two groups was the Brief Psychiatric Rating Scale score for grandiosity. Patients who habitually refused medication experienced a resurgence of grandiose psychotic symptoms shortly after stopping their medication, while the drug compliers had decompensations characterized by anxiety and depression. While on medication, many of the drug refusers seemed to experience an increase in reality contact including awareness of their schizophrenic illness, status as a patient, loneliness, and lack of any life accomplishments. The investigators postulated that "some patients stop medication precisely because they prefer a schizophrenic existence" (p. 1444).

Hogarty, Goldberg, and the Collaborative Study Group (1973) came to the same conclusion in explaining their finding that 40 percent of the patients in their study stopped medication within the first year after discharge.

While these findings are limited to the issue of medication compliance, they also suggest that schizophrenic episodes may sometimes result from the active pursuit of the illness state. Discontinuing medication and other life events, e.g., quitting a job, might at times be purposeful actions taken by the patient to initiate the onset of a schizophrenic episode, rather than events that precipitate psychotic
symptomatology independent of patient control.

Stress-prone factors: Exposure to life events. Although the previous two sections reviewed studies indicating that schizophrenic patients probably generate surplus life events as a result of their prodromal and onset symptoms as well as their lifestyle and goals, there is also evidence that schizophrenic patients are exposed to life events beyond their control in greater numbers than nonpatients. Schwartz and Myers (1977) compared the incidence of life events occurring to schizophrenic patients living in the community 2-3 years after hospitalization with that in community controls. The discharged patients experienced significantly more "uncontrolled" (independent) events during the 6-month period studied than did the controls (.85 versus .42), indicating that individuals with schizophrenia are exposed to more independent life events than the average person while living in the community. When nonindependent life events were considered, the difference was even greater (2.40 versus 1.09).

Dohrenwend and Egri (1981) have pointed out that, given the strong evidence for a genetic component in schizophrenia, schizophrenic patients are more likely to be exposed to psychopathology and problem situations in their immediate families than most people. In the Brown and Birley (1968) study, for example, the psychiatric hospitalization of one patient's mother and the suicide of another were considered independent life events since they were clearly outside the patient's direct control. Yet such events probably occur more frequently to individuals living in families with a genetic loading for schizophrenia, so they cannot be considered totally independent of the patient's disorder. In addition, Dohrenwend and Egri (1981) maintain that "patients are exposed not only to ordinary stressful events that most people experience, but also to events that appear peculiar to their biological and psychological status as psychiatric patients" (p. 20). Dohrenwend (1974) found that many patients reported major life events connected with their social role as psychiatric patients such as changes in their treatment programs. While difficult to document, the socialization in dependency, the side effects of medication, and the stigma of being a psychiatric patient—factors which are often part of the treatment process—may also expose the schizophrenic patient to additional life events.

Summary. These findings concerning the contribution of patients' symptoms and personal choices to the occurrence of life events and psychotic episodes are at odds with the paradigm most investigators in the life events field have been using. The central question researchers have pursued is whether the occurrence of life events beyond the patients' control results in stress which, in turn, exacerbates pathology. However, this section highlighted findings on stress-prone factors which seem important in understanding the relationship between life events and the course of schizophrenic disorder, yet were not considered in the original life events/illness paradigm based on physical illness (Holmes and Rahe 1967). Although the studies showing a Type II relationship between life events and schizophrenic episodes do not provide support for the classic vulnerability/stress model of the course of schizophrenic illness, neither do they disconfirm it. Rather, they point to additional factors which a vulnerability/stress model needs to incorporate to account for these findings. A later section discusses some of these factors in the context of coping mechanisms.

Type III: No Relationship Between Life Events and the Onset of Schizophrenic Episodes. Findings of no relationship between these two variables can be explained in two basic ways: (1) aspects of the research procedures have obscured the relationship or measurement procedures have missed the essential dimensions, or (2) the variables are not causally related in the situation being studied. First, the relevant life events studies are reviewed. Then, methodological and theoretical issues which might be involved in findings of a Type III relationship between life events and schizophrenic episodes are examined.

Life event studies. All studies investigating the role of life events have found some patients who develop schizophrenic episodes in the absence of life events. Leff et al. (1973) identified two specific subgroups of schizophrenic patients for whom life events did not play a major role in onset. Leff and his colleagues found that patients randomly assigned to a placebo medication did not report a surplus of major life events in the 5 weeks before relapse: "Schizophrenic patients living in the community and not taking drugs seem to relapse as a result of the disturbing effect of everyday social interactions" (p. 660). Relapses for patients on medication, however, were associated with the occurrence of life events. Leff and Vaughn (1980) found that relapses among patients living in high EE families also were not preceded by an increase in life events, whereas relapses from low EE families were associated with life events. It should be noted that
Vaughn and Leff (1976a) found that schizophrenic patients who lived in high EE families, had more than 35 hours a week of contact with their families, and were not on antipsychotic medication had a 92 percent likelihood of relapsing within 9 months of discharge, thereby leaving virtually no room for other significant predictive factors to operate.

Studies which have compared schizophrenic patients with other psychiatric patients are difficult to place within the classificatory schema of this review. Of the five studies using this design, three found that schizophrenic patients reported significantly fewer events than depressives before an illness episode (Beck and Worthen 1972; Clancy et al. 1973; Jacobs, Prusoff, and Paykel 1974). However, Lahniers and White (1976) found no differences in the number of life events preceding onset among schizophrenic, neurotic, depressive, and alcoholic patients. Eisler and Polak (1971) also found no differences in the number of social areas in which stressors were reported among DSM-II schizophrenic, depressive, personality disorder, and transient situational reaction patients.

These five studies suggest that schizophrenic patients do not report more life events preceding illness onset than patients in other psychiatric diagnostic groups. They may experience fewer events than depressives before an episode. However, the implications of these findings for understanding the causal relationship between life events and schizophrenic episodes are ambiguous. Life events could play a greater contributory role in the onset of depression, but be important in the onset of schizophrenic episodes as well. The studies are discussed in this third category because they do not support a specific relationship between life events and schizophrenic illness. However, due to the nature of their design—comparing patients with patients—they cannot be considered to present evidence that life events are unrelated to the onset of schizophrenic episodes. For example, Beck and Worthen (1972) found precipitating events for the episode onset of 95 percent of depressives in their study compared to 53 percent of the schizophrenic patients. Similarly, Jacobs, Prusoff, and Paykel (1974) found the depressives reported 50 percent more life events than did the schizophrenic patients. It is clear that neither of these results precludes a contributory role for life events in schizophrenic episode onset.

Although most of the studies failing to find a relationship between life events and schizophrenic episode onset seem to have used psychiatric comparison groups and are subject to the interpretative ambiguity just noted, the following methodological and conceptual issues suggest other possible contributing factors.

Factors accounting for the lack of an observed relationship: Measurement issues. One possibility is that major life events occurring before onset were overlooked. The life events schedules used in most studies are oriented toward married, working people, not the typical isolated, single, unemployed schizophrenic patient. Thus, stressful life events which occur commonly to schizophrenic patients—e.g., change in a patient’s therapist at the community mental health center, notice to appear for an interview to review eligibility for SSI benefits, and rejection by acquaintances who learn that the patient is a “mental case”—are not adequately covered by these schedules. As mentioned earlier, a large proportion of psychiatric patients specifically mentioned these types of events, ones which were related to their psychiatric illness or its treatment, when they were asked what recent event had changed their activities (Dohrenwend 1974).

A subtle diagnostic bias may also diminish the association between life events and onset. One lingering effect of theories which have viewed schizophrenia as a completely endogenous disorder is that “the presence of a stressful life event leads diagnosticians to ignore the presence of schizophrenia” (Spring and Coons 1982, p. 31). To an unknown degree, some cases meeting diagnostic criteria for schizophrenia may have been diagnosed as nonschizophrenic if the illness seemed to be preceded by a stressful event.

Elsewhere in this issue, Falloon (1984) discusses other reasons why hospitalization is an unreliable criterion for episode onset. Even studies which use independent criteria to establish the presence of a schizophrenic episode depend upon the hospital as the intake point for recruiting their samples. Yet, Link and Dohrenwend’s (1980) epidemiological study found that a substantial minority of persons with diagnosable schizophrenia in the general population have never been in inpatient or outpatient treatment. The effects of limiting life events studies to samples of identified patients are difficult to determine, but Dohrenwend and Egri (1981) maintain the following:

On the basis of analysis of the epidemiological literature on true and treated rates, the literature on extrem situations, and the World Health Organization cross-national studies, we suspect that samples of subjects who are admitted to hospitals in modern Western societies after developing schizophrenic episodes are biased in the direction of underestimating the etiological importance of recent stressful life events. (p. 22)
Some technical methodological procedures may also diminish the observed link between life events and the onset of illness. Rabkin and Struening (1976) argue that sample size deficiencies may have minimized this relationship. The results of the Harder et al. (1980) study suggest that a measure of change in level of stress preceding onset rather than level of stress per se might show a more powerful relationship between life events and the development of schizophrenic episodes. Another implication from the Harder et al. (1980) study, as well as that of Brown and Birley (1968), is that events in the few weeks just before onset play an especially significant role in triggering episodes. Most life events studies have not been designed to evaluate changes in level of stress before onset and have used time periods substantially longer than the 3-12 weeks used by these two studies that produced significant positive findings. Reliability of many life event scales may also hamper the uncovering of significant relationships between life events and onset of episodes. Neugebauer (1983) found the mean intrapair agreement between schizophrenic patients and informants for the 102-item PERI life event checklist (Dohrenwend et al. 1978) among 18 patient/informant pairs was only .22.

In summary, deficiencies in measurement instruments, sample bias, sample size, and methodological inadequacies may all contribute to weakening the findings of a relationship between life events and schizophrenic episodes. Although it is always possible to attribute negative findings to methodological problems, the nature of life events and the nature of schizophrenia seem to interact, making it particularly difficult to research the impact of one on the other.

Factors accounting for the lack of an observed relationship: High vulnerability. Another possible factor in producing negative results is that minor, idiosyncratic events may be sufficient to precipitate symptom exacerbation in some cases. In fact, within the vulnerability/stress model, a highly vulnerable person is predicted to be "one for whom numerous contingencies encountered in daily living are sufficient to elicit an episode" (Zubin and Spring 1977, p. 109). Such minor life events could easily escape detection by the standard life event assessment procedures. Lewinsohn and Talkington (1979) have pioneered the use of "micro-events" in studies on depression, but to date, their procedure has not been used with schizophrenic patients. Examples of groups that may be particularly vulnerable include patients without antipsychotic medication (Hogarty and Ulrich 1977) and patients with a strong family history of schizophrenic disorder.

Factors accounting for the lack of an observed relationship: High prevailing stress. Highly stressful environments might also obviate the need for major life events to occur to produce onsets of schizophrenic episodes. Brown, Birley, and Wing (1972) have described a process whereby a relapse could be precipitated by ongoing interactions with a high EE relative without additional major life events: "In the presence of a socially intrusive relative . . . [the patient] is unable to withdraw, and any residual or latent thought disorder will become manifest as expressed delusions or odd behavior" (p. 256). In the case of patients from high EE homes who have more than 35 hours per week of face-to-face contact (high prevailing stress) and are also off-medication (high vulnerability), the need for a precipitating life event would seem to be virtually eliminated. As mentioned earlier, these patients have been found to have a 92 percent likelihood of relapsing within 9 months (Vaughn and Leff 1976a).

Using a different methodology, Serban (1975) examined the prevailing stress levels of acute and chronic schizophrenic patients. On a 130-item scale he developed to cover areas of daily living, chronic patients reported the highest level of stress, normals the lowest, and acute patients an intermediate level. Serban described the chronic schizophrenic patient as highly stressed by the demands of daily living:

"The surrounding world is a source of turmoil; almost everything creates anxiety and discomfort. . . . Everything appears to represent either an insurmountable demand which society places on them or worry induced by frustrated expectations. [p. 405]"

When hospitalized, only 38 percent of the schizophrenic patients could identify 1 of the 21 categories of major life stressors as a contributing factor. Serban concluded that the most important factor in frequent readmissions was the continuously high level of stress. He argued that life events, even when present, "contribute to admission in the majority of cases . . . only by increasing the already existing high global stress in the life of schizophrenics" (p. 405). Brown, Harris, and Peto (1973) also mentioned that consideration must be given to the "total environmental effect," including ongoing difficulties and "long-term social problems not the result of a life event in the period studied" (p. 171).

Factors accounting for the lack of an observed relationship: Psychological and biological fluctuations. Although life events research has...
focused on the role of high external stimulation. Wing (1978) and others have also pointed out the dangers of understimulating environments. Some early theorists such as Kahn and Kretschmer emphasized the role of isolation in precipitating delusions even without external precipitating events. These findings were based on their observations of psychiatric patients and the occurrence of delusions in life situations involving isolation such as deafness and incarceration in prison (Arthur 1964). Research on sensorily deprived environments has also shown that psychotic symptoms including hallucinations and delusions can occur in situations of prolonged sensory deprivation (Lilly 1956). The proclivity of schizophrenic patients toward isolation is well known, and in extreme cases where patients withdraw from social and other sources of stimulation for long periods of time, they might inadvertently or advertently simulate sensorily deprived environments. In this manner the complete absence of major and minor life events could potentially exacerbate psychotic symptoms. However, understimulating environments are usually thought to contribute more to the development of negative symptoms such as poverty of speech and blunted affect than to the development of the positive symptoms of hallucinations and delusions that characterize an acute schizophrenic episode (Wing 1978). Although isolation and withdrawal seem frequently to precede onset of schizophrenic episodes, their role has not been clarified. Van Putten, Crampton, and Yale (1976) have identified a group of patients who seem to actively seek a delusional state of mind, and who may learn ways to cultivate psychotic states by discontinuing their medication and focusing on internal processes. Thus, in some cases of relapse characterized by increasing preoccupation with enjoyed hallucinations and delusions, external events may play only a minor role.

Some episodes may be triggered by fluctuations in biochemical factors or neurophysiological states that are not initiated by external stressors (Bowers 1980). While acknowledging that the biochemistry of psychotic symptoms is not well understood, Zubin and Spring (1977) also mention that variations in internal chemistry could produce exacerbation of symptoms in the absence of external stressors. The possibly very important role of neurophysiological variability in producing or initiating relapse must await a more precise understanding of the biochemical pathways that contribute to psychotic symptoms. The brevity of our discussion of such factors reflects the focus of this article rather than the level of importance that biochemical and neurophysiological variables might have in influencing relapse.

Summary. This review of possible factors leading in some studies to the absence of an observed relationship between major life events and schizophrenic episodes indicates that a vulnerability/stress model needs to recognize individual variability in the causal pathways for schizophrenic episodes. Variations in premorbid vulnerability and prevailing environmental stress need to be incorporated into the model and are likely to affect whether a major life event is needed to precipitate a relapse. As Spring and Coons (1982) have pointed out:

Stress might be a sufficient cause for some schizophrenias, a necessary cause for others, and an irrelevant factor for still others. Progress in explaining the role of stress may come only by way of evaluating subgroups of schizophrenics who are homogeneous with respect to etiology, underpinnings of vulnerability, and premorbid degree of vulnerability. [pp. 28–29]

In addition, preexisting vulnerability may be potentiated differently among different individuals, with some people being more affected by external events involving their social support system such as the death of a relative, and others by blows to their self-esteem such as failing a test at school or being fired from a job. An adequate model of schizophrenic relapse also needs to cover situations in which the patient willfully courts the illness state or hospitalization. Thus, the role of stress in precipitating onsets of schizophrenic episodes may vary considerably among different subgroups of schizophrenic patients.

The final section of this article considers the coping responses schizophrenic patients make in response to stressful events and situations. These also have a role in understanding the relationship between stress and illness because coping responses have been shown to amplify or diminish the inherent stressfulness of major life events. But, first, research on family atmosphere, which was introduced here as a type of prevailing stress that interacted with life events in predicting the onset of schizophrenic episodes, is reviewed.

**Familial Stress: Historical Background**

In 1927 Sullivan suggested that disturbed family relationships might be linked to subsequent schizophrenic illness, and in 1934, Kasanin, Knight, and Sage made the first systematic attempt to study the environmental...
effects of parents in the pathogenesis of schizophrenia (Hirsch and Leff 1975). Since that time a number of well-known theories and studies, rich in clinical detail and notional phrases, have been advanced describing the role of the parental family in the development of schizophrenia. Among the prominent, psychoanalytically derived, etiological hypotheses are the following: Fromm-Reichmann’s (1948) description of the “schizophrenogenic mother”; Lidz and his colleagues’ (1957) delineation of “marital skew” and “marital schism” in parents of schizophrenic patients; Bateson and his colleagues’ (1956) “double-bind” hypothesis; Wynne and his colleagues’ (Wynne et al. 1958; Wynne and Singer 1963a, 1963b) theory of “pseudomutuality” in the communication patterns of families with schizophrenic offspring; and Laing’s (1972) essays dealing with intrafamilial, interfamilial, and extrafamilial relations and networks.

Two other research tactics have recently been pursued which involve the prediction of an individual’s schizophrenic symptoms from certain measurable characteristics of the social or familial environment. We review here familial factors that have predicted relapse in an existing schizophrenic illness in various patient samples and factors that have predicted the onset of schizophrenia spectrum disorders in a sample of disturbed teen-agers. This research has provided empirical validation that measurable aspects of the social environment are associated with the course of schizophrenia.

**Expressed Emotion and Relapse**

Research on social factors in the community that might be related to the relapse and readmission of schizophrenic patients began in the 1950s as investigators both in London and the United States recognized the changing pattern of hospital care brought about by advances in psychopharmacology. Shorter hospitalization, frequently followed by later patient relapse and readmission, generally replaced long-term hospital care. Thus, investigations of social factors in the community that might be related to patient relapse and readmission were undertaken. In the United States, Simmons (Freeman and Simmons 1963) launched a project to uncover factors that affected the adaptation of patients discharged from mental hospitals. In concurrently, in London, George Brown and his colleagues began the first in a series of studies of social factors in the community which affected patients’ hospital readmissions.

Freeman and Simmons (1963) set out to predict community performance levels and symptomatic behavior of discharged patients from social and cultural variables including relatives’ attributes. Personality characteristics of patients’ relatives were assessed in several ways: Srole’s personality scales for anomie, authoritarianism, frustration, rigidity, and withdrawal; Brim and associates’ personality scales; and clinical social workers’ ratings on Borgatta’s scales for 14 personality characteristics. Freeman and Simmons reported some relationships between patients’ community performance level and relatives’ personality traits, but found no differences on any personality scales between relatives of patients who remained in the community and relatives of patients who were rehospitalized. In addition, they found no association between family type, social class, values, or expectations and patients’ symptomatic behavior.

The authors concluded that “the course of the illness itself may not be related primarily to the setting the patient returns to after hospitalization or to [personality] characteristics of his family associates” (Freeman and Simmons 1963, p. 200).

Brown and his colleagues (Brown, Carstairs, and Topping 1958; Brown 1959), like Freeman and Simmons, initially found that patients discharged to homes of spouses and parents did not have different relapse rates; however, Brown (1959) found that patients discharged to homes of spouses and parents or to hostels relapsed at a significantly higher rate than those discharged to live with their siblings or in “lodgings.” Brown et al. (1962) then proceeded to the first of a series of studies in which patients’ family environments were assessed by focusing on the interpersonal relationships of the relatives and patient rather than on relatives’ personalities. Families were rated either high or low on emotional involvement with the patient, and these ratings proved to be associated with the return or exacerbation of patients’ schizophrenic symptoms during a followup period. Fifty-six percent of patients living with families rated high on emotional involvement relapsed, in contrast to 21 percent of patients living with families rated low on emotional involvement.

Following the 1962 study, family assessment methods were standardized. A semistructured interview, the Camberwell Family Interview (CFI), and a reliable system for rating emotional expression during the interview were developed (Brown and Rutter 1966; Rutter and Brown 1966) to assess the quality of enduring interpersonal relationships within the family. More specifically, measurement of the quality of family
predicted patients' symptomatic hospital admission significantly. Patients' relatives at the time of withdrawal were collected. Measures of patient behavior were repeated the early study. In addition to family and psychiatric measures, Brown, Birley, and Wing (1972) structured Present State Examination to determine diagnoses and relapse, (Wing, Cooper, and Sartorius 1974) who have enduring relationships with the patient.

Other relatives or significant others include the spouse, siblings, and not limited to biological parents, but members who might be assessed are enduring relationships was operationalized by scales measuring the number of critical and positive remarks made by the relative about the patient, the presence or absence of hostility, and the extent of warmth, overprotectiveness, or emotional overinvolvement, along with more than a dozen other scales. In subsequent research, the Camberwell Family Interview has usually been administered to each relative living with the patient. The tape-recorded interview has then been scored for the scales just noted. An index of expressed emotion (EE) has been empirically derived to maximize the prediction of schizophrenic relapse. Family members are rated high on expressed emotion if they score high on the scales measuring critical comments, emotional overinvolvement, or hostility. If any family member is rated high on expressed emotion, the family environment is also considered to be high. For a detailed review of the concept of expressed emotion, see Kuipers (1979). Family members who might be assessed are not limited to biological parents, but include the spouse, siblings, and other relatives or significant others who have enduring relationships with the patient.

Using the standardized Camberwell Family Interview to measure expressed emotion, and the semi-structured Present State Examination (Wing, Cooper, and Sartorius 1974) to determine diagnoses and relapse, Brown, Birley, and Wing (1972) repeated the early study. In addition to family and psychiatric measures, measures of patient behavior including work impairment, disturbed behavior, and social withdrawal were collected. Measures of expressed emotion taken from patients' relatives at the time of hospital admission significantly predicted patients' symptomatic relapse over the 9-month followup period. Relapse was defined as a return or exacerbation of schizophrenic symptoms elicited by the Present State Examination. More than three times as many patients from high EE families relapsed (58 percent) as patients from low EE families (16 percent).

Two replications of Brown's work have been carried out. Vaughn and Leff (1976a), using the same EE scales and diagnostic procedures with a shortened family interview (Vaughn and Leff 1976b), found strikingly similar results. In addition to replicating the main result that patients living in high EE homes had a higher relapse rate, they also found that the relapse rate for high EE patients varied according to whether patients had high (over 35 hours) weekly contact with relatives and whether they took antipsychotic medication regularly. Low contact with relatives and regular medication acted as protective factors for high EE patients. Relapse rates of low EE patients, on the other hand, did not interact with high or low relative contact or medication compliance during the 9-month followup period.

In a 2-year followup of the Vaughn and Leff sample (Leff and Vaughn 1981), the proportion of relapses in the high and low groups remained virtually unchanged. However, it became obvious that even the low EE patients were, in fact, protected from relapse during the 2-year followup period if they continued to take antipsychotic medication regularly.

Vaughn and Leff's study was subsequently replicated by Vaughn and her colleagues (1982, in press) in the United States at the UCLA Mental Health Clinical Research Center for the Study of Schizophrenia. Once again, the EE index, that is, criticism or overinvolvement expressed by a key relative about a patient at the time of admission, proved to be the best single predictor of symptomatic relapse in the 9 months after discharge from the hospital. As in the British studies, the association between relative's expressed emotion and patient's relapse was independent of all other variables investigated, including behavior disturbance, schizophrenic symptoms at admission and discharge, and work impairment.

Two differences between the California and London samples are noteworthy. First, in London more than half of the families assessed were rated low on EE, whereas in the California sample only a third of the families were low on EE. Second, significantly more of the California patients had a poor clinical outcome at 9-month followup. Table 1 gives relapse rates from the three studies.

These studies have established that the familial environment is a strong predictor of the relapse rate of schizophrenic patients. Along with the life events findings, they constitute the most important known socioeconomic factors that appear to affect the course of schizophrenic disorders. However, a critical question concerns the nature of the underlying mechanisms that are tapped by the EE measures.

In an effort to clarify the meaning of the EE index, two lines of investigation have been pursued—behavioral observations of relative and patient interactions, and psychophysiological indexes of patient arousal in the presence of a relative. First, the studies employing physiological measures are reviewed.

It has been hypothesized that high levels of criticism and emotional overinvolvement by relatives may contribute to higher levels of physiological arousal in the patient, thereby precipitating a return of an individual's schizophrenic symptoms.
Table 1. Relapse rate as a function of familial expressed emotion level

<table>
<thead>
<tr>
<th>Studies</th>
<th>n</th>
<th>High EE relapsed</th>
<th>Low EE relapsed</th>
<th>Level of statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, Birley, &amp; Wing (1972)—London</td>
<td>91</td>
<td>58%</td>
<td>16%</td>
<td>.001</td>
</tr>
<tr>
<td>Vaughn &amp; Leff (1976)—London</td>
<td>37</td>
<td>48%</td>
<td>6%</td>
<td>.007</td>
</tr>
<tr>
<td>Vaughn et al. (1981)—U.S.</td>
<td>54</td>
<td>56%</td>
<td>17%</td>
<td>.015</td>
</tr>
</tbody>
</table>

(Brown, Birley, and Wing 1972).

This hypothesis has been tested in two studies which measured autonomic arousal while patients interacted with their high or low EE family members. In both studies, the principal measure of autonomic arousal was the rate of spontaneous electrodermal responses, i.e., responses that occur in the absence of known eliciting stimuli.

In the first study, Tarrier et al. (1979) collected measures of spontaneous electrodermal responses, heart rate, and blood pressure for a sample of remitted schizophrenic patients with either high or low EE relatives, first during 15 minutes with the experimenter only, and then for 15 minutes in the presence of the key relative. Results of this study showed that:

During the 15 minutes of recording of sweat gland activity, when the relative was absent, the low and high EE patient groups were similar in level of arousal. However, during the second 15 minutes, with the relative present, a significantly (p < .01) greater amount of spontaneous activity occurred in high EE patients. High EE patients also showed an increase in diastolic blood pressure in the presence of the relative compared to a decrease in low EE patients (p < .002). [pp. 312–313]

In a subsequent experiment, Sturgeon et al. (1981) found a significant reduction in the rate of spontaneous fluctuations of skin conductance responses when the relatives were present among patients with low EE relatives, but not among patients with high EE relatives. This finding is consistent with the results of Tarrier et al. (1979). Whereas measures were taken in the homes of 52 patients who were in relative remission in the earlier study, measures were taken from acutely ill patients in a laboratory setting in the Sturgeon et al. (1981) study. These findings, using different samples of schizophrenic patients evaluated in different settings, offer concurrent validation for the hypothesis that high autonomic arousal in a schizophrenic patient is associated with social stimulation by a high EE family member.

Elevated arousal has often been presented as the defining characteristic of stress, and prolonged elevated arousal has been found to be associated with the development of a variety of physiological disorders (Selye 1956). The finding of elevated autonomic arousal among schizophrenic patients when a high EE relative is present provides a link between social and biological variables in understanding how familial environment can affect the course of a schizophrenic patient’s illness. (The possible role of autonomic abnormalities in the developmental course of schizophrenic disorder is considered in detail by Dawson and Nuechterlein earlier in this issue.)

The second line of investigation into the mechanisms underlying the EE measures has focused on behavioral dimensions of the relationship between the patient and the relative. Brown, Birley, and Wing (1972) have hypothesized as follows:

A high degree of expressed emotion on one occasion is a measure of a relative’s propensity to react in that way to that particular patient, even though other factors may be needed to precipitate this. [p. 241]

Thus, expressed emotion is thought to represent an enduring potential characteristic of the relative’s behavior toward the patient.

The behavioral characteristics of interactions between relatives and patients have been investigated by Kuipers et al. (1980) and by Doane et al. (as reported by Falloon et al. 1982). The sample studied by Kuipers et al. consisted of 20 patients and their relatives/parents, spouses, and siblings. They examined differences between low and high EE relatives’ behavior during a joint interview with patient, relative, and interviewer. Their preliminary results suggest that the high EE relative’s reaction to a schizophrenic family member during an interview by a third person was to spend a considerable amount of time talking (55 percent) and less time (36 percent) looking at (listening to) the patient. Percentage of time spent speaking was not related to the total interview length or the amount of time the
interviewer spent talking, but was related to the relative’s EE level. Low EE relatives showed the reverse of this pattern. They spent more time listening and allowed silences, giving ill patients more chance to participate and express themselves. Kuipers et al. concluded that the differential reaction of relatives to an acutely ill schizophrenic patient provides preliminary evidence that high EE relatives are behaviorally distinguishable from low EE relatives during such interactions.

In another attempt to discover whether relatives’ high EE status indicates discriminable, characteristic negative and/or intrusive interpersonal modes of relating to the patient that are evident in their interactions, Doane et al. (1981) applied a direct interaction measure of parental affective style to patient/relative triads. This interaction measure, termed affective style (AS), is coded from a typed verbatim transcript of a directly observed family interaction task. The task, also called the confrontation, is a modification of Strodebeck’s (1954) revealed-differences technique. It involves a series of procedures which result in a triadic family discussion of problems or issues relevant to the given family. The primary negative codes of affective style include two kinds of criticism—guilt induction and intrusiveness. Certain AS codes seem to be interpersonal analogues of some of the EE constructs and may represent behavioral counterparts of the interview-based index of expressed emotion.

In preliminary pilot work, Doane and her colleagues, as reported by Falloon et al. (1982), have found that high EE relatives with an excess number of critical comments on the Camberwell Family Interview (CFI) also made significantly more critical remarks during the direct interaction task than did relatives rated low on the EE scale of criticism. Those relatives designated as high EE because of overinvolved rather than critical statements during the CFI displayed less criticism but significantly more intrusive remarks during the direct interaction task, such as telling the patient how he or she thinks or feels. Thus, this pilot work suggests not only that verbal behavioral differences exist between high and low EE relatives, but also that there are subgroup differences within the high EE group related to scores on the different EE scales.

Summary. The EE research is consistent with a vulnerability/stress model of schizophrenic relapse. This model predicts that persons vulnerable to schizophrenic episodes will have a lowered likelihood of relapse if their exposure to stressful events and situations is reduced. Patients who had less than 35 hours a week of contact with high EE relatives were found to have a lower relapse rate than patients who had more than 35 hours a week of contact with a high EE relative. Similarly, the reduced relapse rate found among patients on antipsychotic medication also conforms to predictions of a vulnerability/stress model. In addition, the findings that patients exposed to high EE relatives have a significantly higher relapse rate than patients interacting with low EE relatives and that patient autonomic arousal is elevated in the presence of a high EE relative support the conceptualization of high EE as a potent familial stressor for schizophrenic patients.

Family Studies Predicting Onset of Illness

While a body of research has developed over the last 20 to 30 years focusing on the influence of the family on the course of an established schizophrenic illness, studies of family circumstances that antedate a first episode of schizophrenia are scarce. A major difficulty has been the selection of criteria by which appropriate families could be isolated for study. Goldstein and Rodnick of the UCLA Department of Psychology Family Project (Goldstein et al. 1978a) have successfully conducted a longitudinal prospective study of the development of schizophrenia spectrum disorders by examining disturbed nonpsychotic adolescents and their families. Their research has focused on reciprocal family interaction patterns between parents and their adolescent children. Their “ultimate aim was to determine whether there are observable and consistent styles of coping that exist among family members which relate to the patterns of psychopathology manifested (at a later date) by an adolescent” (Goldstein et al. 1968, p. 235).

One of the primary family variables under study was a Singer-Wynne measure of communication deviance (CD) among the adolescents’ parents. The original communication deviance studies of Wynne and his colleagues (1958) grew in part from their observations of communication and role structure in a sample of four families, each with a schizophrenic offspring. Wynne and Singer hypothesized that the form and structure of family-wide transactions might influence the cognitive development of the offspring and facilitate the development of the schizophrenic patient’s thought disorder (Wynne et al. 1958; Wynne and Singer 1963a, 1963b). The family variable under study, which is generally referred to as “intrafamilial relationships,” was specifically operationalized using
speech patterns of schizophrenic patients' biological parents. Projective test materials, usually Rorschach or Thematic Apperception Test (TAT) cards, have been used to elicit speech samples from individual parents and sometimes from family members together. Types of communication deviances scored on the CD codes include lack of commitment to ideas or percepts, unclear or idiosyncratic communication of themes or ideas, language anomalies, disruptive speech, and closure problems. Measures of CD have been summarized, using standardized procedures, as total amount of CD (Singer and Wynne 1966) and also as factor scores reflecting different styles of CD (Jones 1977). Wynne and Singer (1963a, 1963b) used the total CD measure to differentiate parental families with schizophrenic offspring from other families. Hirsch and Leff (1975) have reviewed those studies and reported mixed results in their attempt to replicate the specificity of CD to families with schizophrenic offspring.

Goldstein et al. (1978a) were the first to use the CD measure to predict onset of schizophrenia spectrum disorders. The subjects selected for their high-risk study were nonpsychotic, disturbed adolescents seen at an outpatient clinic for emotional difficulties. This high-risk sample differs from most other high-risk samples because it was not selected on the basis of parental schizophrenic disorder. Two measures of risk for these adolescents were used: (1) their presenting behavior problems and (2) a parental CD measure. Adolescents were deemed at high risk for the development of schizophrenia spectrum disorder if they were withdrawn and socially isolated or if they were engaged in active family conflict. In addition, adolescents were considered at high risk if their parents scored in a specified high range on the CD measures.

Doane et al. (1981) reported that a recent analysis of the complete Family Project sample of high-risk adolescents at 5-year followup showed statistically significant relationships between both parental CD and parental AS with outcome. The AS and CD variables were also combined to predict outcomes, resulting in the most precise prediction of subsequent schizophrenia spectrum disorder in offspring.

In addition to the responses to TAT cards from which CD measures were scored, a wealth of other material was collected from these families (Goldstein et al. 1968), including a standardized family interview, two simulated interaction sequences followed by direct interaction tasks, and skin resistance measures of parents and adolescents. In an effort to determine the interpersonal relationships of communication deviance and other aspects of familial interaction patterns and attitudes, UCLA Family Project researchers have recently compared CD scores and direct interaction patterns (Lewis, Rodnick, and Goldstein 1981); scored Family Project Interviews for expressed emotion (Norton 1982); and compared affective style and expressed emotion scores (Valone et al., in press). Most recently, these investigators have compared parental and adolescent electrodermal measures with EE scores from Family Project interviews in an attempt to extend the network of EE correlates (Valone, Goldstein, and Norton, submitted for publication). These additional analyses of the Family Project data base have resulted in interesting hypotheses concerning the relationships and meanings of various measures.

Lewis, Rodnick, and Goldstein (1981) found significant associations between CD and the degree of disruption of communicational focus in triadic family discussions. Thus, the CD that was scored from TAT responses was manifested in direct family interactions. Furthermore, high CD families had significantly fewer father-central role structures.

Norton (1982) was able to rate the Family Project interviews for expressed emotion. Her work represents the first instance of rating expressed emotion from an interview other than the CFI. She reported that when both parents were defined as high EE, 90.9 percent (10 of 11) of the adolescents received followup diagnoses of schizophrenia or hypothesized related disorders such as probable schizophrenia and borderline or schizoid personality disorders. In families in which both parents had been rated low on EE, only 9.5 percent (2 of 21) of the adolescent subjects received these diagnoses, while with a pattern of one low and one high EE parent, 25 percent (5 of 20) received such diagnoses at followup.

Valone et al. (in press) compared Norton's EE ratings with the Doane et al. (1981) ratings of affective style. Doane et al. (1981) had hypothesized that affective style ratings of direct interaction sequences might be the interpersonal analogues of EE interview ratings. Indeed, Valone et al. found that when both parents were high EE, they expressed high levels of both mild and harsh criticisms in direct interactions with their offspring. When both parents were low EE, they manifested few mild or harsh criticisms in direct interactions.

In a recent analysis of parental and adolescent electrodermal measures,
Valone, Goldstein, and Norton (submitted for publication) obtained preliminary results which suggest that adolescents interacting with a high EE parent show greater autonomic reactivity than adolescents interacting with a low EE parent. Furthermore, high EE parents themselves appear to have higher levels of autonomic reactivity during these discussions than do low EE parents.

In addition to generating hypotheses concerning family factors that precede the onset of schizophrenia spectrum disorders, the UCLA Family Project researchers have sought to clarify the relationships among various measures of familial communication and environment. These studies offer preliminary indications that interactions in high CD families differ from those in low CD families. Furthermore, while both CD and AS are significantly predictive of outcome, a combination of the two measures is the most precise predictor of the onset of schizophrenia spectrum disorders. In this sample, it also appears that EE ratings of critical attitudes in parents are reflective of parental criticism of their adolescent offspring during a direct interaction task summarized as AS. Finally, at 5-year followup, adolescents who had two high EE parents were much more likely than adolescents who had two low EE parents to obtain diagnoses of schizophrenia, probable schizophrenia, or borderline or schizoid personality disorders.

The findings of the UCLA Family Project researchers from the longitudinal study of high-risk, nonpsychotic but disturbed adolescents indicate a conceptual transition in the CD measure. Wynne and colleagues first theorized that CD was highly characteristic of parents of schizophrenic patients, and its presence in the parental family was a necessary antecedent to the offspring's development of schizophrenia. Results of the UCLA Family Project research (Doane et al. 1981) indicate that parental CD was present in the vast majority of cases in which the offspring developed subsequent schizophrenia spectrum disorders (9 of 10). However, a number of high CD families did not have schizophrenia spectrum disorders in key offspring (7 of 16). Thus, at this point, parental CD does not appear to be a sufficient condition for development of schizophrenia spectrum disorders among offspring, although long-term followup of these individuals is still in progress.

Summary. The results of the ongoing UCLA Family Project indicate that certain types of affective style are often present in parents of disturbed adolescents who develop schizophrenia spectrum disorders, and that these patterns exist before onset. As Doane, Goldstein, and their colleagues have shown, the AS index, which includes directly observed critical, guilt-inducing, and intrusive statements made by parents to their offspring, can be construed as an interpersonal analogue of the EE construct developed from parental attitude measures. High EE has been clearly associated with higher rates of relapse, and its impact on course of illness is modified by other variables such as medication compliance and degree of exposure to relatives, while negative AS has been related to high scores on EE and the onset of schizophrenia spectrum disorders. Thus, high EE and negative AS can be conceptualized as types of stressors (perhaps similar or at least overlapping) that operate within the family environment. As such, EE and AS variables are readily interpretable within the vulnerability/stress model.

The CD findings allow for at least four differing interpretations, which need not be mutually exclusive. Disruptions, language anomalies, and lack of clarity and closure in parental interactions could function, in a manner similar to overinvolved and overly critical attitudes in high EE relatives, by directly inducing stress. (Perhaps a study along the lines of that by Tarrier et al. 1979, or Valone, Goldstein, and Norton, submitted for publication, regarding EE could clarify whether interactions with parents high on CD are associated with elevated autonomic arousal in the patient.) A second possible interpretation is that the underlying mechanism in CD may involve direct parental influence of the cognitive development of their schizophrenic offspring, as Wynne et al. (1958) theorized. From an early age, the child may learn a faulty style of communication that could facilitate the development of thought disorders similar in style to the CD being modeled in the family. Another alternative is that CD reflects a subclinical level of thought and communication disorder that is genetically transmitted and that expresses itself as clinical schizophrenia in only some family members. The fourth possibility is that high levels of CD among parents may result from rearing disturbed offspring. Although CD was present before the onset of schizophrenia spectrum disorders, the UCLA Family Project selected families with adolescents who were already disturbed although not in treatment at the time of initial assessment. Elevated CD has also been found in parents of retardates, suggesting that CD may not be specific to parents of schizophrenia spectrum offspring and might be partially reactive to the offspring's disturbance (Wender et al. 1977). These possibilities need not be
mutually exclusive. Whether CD is genetically transmitted, directly stress-inducing, reactive, and/or a modeling influence has yet to be determined. However, it does appear that EE, AS, and CD are familial variables that help to predict the onset of schizophrenia spectrum disorders in a sample of disturbed, nonpsychotic adolescents, and that at least EE helps to predict the likelihood of relapse following an episode of a schizophrenic psychosis.

Coping Responses and Schizophrenic Episodes

While the previous two sections reviewed the impact of socioenvironmental stressors on the course of schizophrenic disorder, this section highlights the individual’s ability to modify the stressfulness of such situations. Rahe and Arthur (1978), two of the key contributors to our understanding of the relationship between socioenvironmental stressors and illness onset, have warned against oversimplifying this connection into a deterministic causal relationship or, alternatively, of abandoning the untangling of this relationship due to “weak” or sometimes nonsignificant findings.

As the life change and illness concept has become popularized, a certain imprecision of thought has become apparent. It has seemed to some as if there is as close and immediate relationship between life change and illness as is the relationship between staphylococci endotoxin and acute dysentery. This kind of conceptualization is simplistic. There are several intervening steps which exist between subjects’ recent life change experience and their subsequent near-future illness symptoms and reports. It is necessary to think in terms of a model which embraces the whole series of intervening variables. [Rahe and Arthur 1978, p. 12]

Although the association between EE and relapse is more robust, half of the patients living in high EE families have been found to avoid relapse during the period studied. An overly simplified model will not be sufficient to explain the complex family environment/illness interrelationships observed here either.

It is clear from numerous laboratory studies in which animals have been exposed to stressful stimuli that environmental factors can produce increased arousal and changes in hormonal and immunological competence which, when prolonged, culminate in physical and even psychiatric (“learned helplessness”) illnesses (Selye 1956; Seligman 1975). Although the same mechanisms linking environmental stimuli and physiological responses exist in humans, “the human ability to recruit social support, defend intra-psychically and cope environmentally may limit arousal to non-pathogenic levels” (Andrews and Tenant 1978, p. 545).

Pearlin and Schooler (1978) have defined this ability of persons to modulate the impact of stressors as coping: “Coping refers to behavior that protects people from being psychologically harmed by problematic social experience” (p. 2). In this review, coping responses will be broadly defined to include the three areas mentioned by Andrews and Tenant (1978) as intervening variables: (1) cognitive coping abilities which allow the person to neutralize the perception of stressors as problematic through subjective appraisal mechanisms and cognitive control strategies; (2) behavioral coping abilities which enable the individual to act directly to resolve the environmental stressor; and (3) social support recruitment which provides the person with emotional support to buffer the impact of stressors. These are factors that have been found to mediate the impact of stressors during laboratory studies conducted with normals and in studies of nonschizophrenic disorders. Unfortunately, little research has been conducted specifically on the coping responses of schizophrenic patients. However, findings from other studies on different aspects of schizophrenic disorder provide some evidence about probable deficiencies in the coping abilities of schizophrenic patients. For example, documented deficits in areas such as social and problem-solving skills could diminish the ability of schizophrenic patients to cope effectively with stressful situations generated by life events and familial tension. Therefore, we now review research which suggests that the usual level of stressfulness that follows from life events and ongoing difficult situations is amplified for patients with schizophrenia because of their pervasive cognitive and social impairments.

Cognitive Coping. Cognitive coping includes the appraisal process and cognitive control strategies, both of which have been shown to regulate emotional arousal in the face of stressors. Although appraisal and cognitive control strategies overlap because both may involve the use of language (“self-talk”) that is similar in content, they are temporally and functionally distinct from one another. Appraisal refers to an almost instantaneous perceptual process by which people determine whether an event or situation has positive, negative, or benign implications toward their well-being. Cognitive control is an active process aimed at reducing stress by reinterpreting the meaning or reevaluating the threatening implications of the event. Thus, cognitive control strat-
...and are only used if the event or situation is appraised as threatening.

**Cognitive appraisal.** This section considers empirical evidence and theoretical formulations which suggest that an individual's cognitive appraisal of a socioenvironmental stressor mediates the amount of stress generated by that event or situation. One useful model has been proposed by Rahe and Arthur (1978) who emphasize the interaction of a life event, the cognitive appraisal of its threatening implications, the individual's response, and the illness behavior. The first step in their model, the perception of the stressor, is presented as a “polarizing filter” that can magnify or diminish the stressfulness of an event. The notion that the quality and intensity of emotional reactions to events are determined by cognitive appraisal and are alterable by reappraisal has been a consistent finding of Lazarus and his co-workers since the early 1960s. A series of studies reviewed in Lazarus, Averill, and Opton (1970) showed that differing cognitive appraisals used by subjects while viewing stressful films affected the level of stress induced by the films as measured by heart rate and self-report.

However, the initial research on life events and stress ignored subjective ratings of the stressfulness of events and focused solely on the amount of social readjustment demanded by an event (Holmes and Rahe 1967). Beginning in the 1970s (Paykel, Prusoff, and Uhlenhuth 1971), researchers added measures of subjective appraisal and found that groups differed in the perceived amount of stressfulness associated with life events. Lundberg and Theorell (1976) reported that a group of myocardial infarction patients gave significantly higher ratings than a control group on ratings of the perceived “upset” versus degree of “adjustment” that would result from life events. These studies suggest that subgroups of individuals may appraise stressors in idiosyncratic ways and that perceived stressfulness is an important mediator of the relationship between life events and stress.

Unfortunately, very little research has been conducted directly on the cognitive appraisal process among schizophrenic patients. However, there are many anecdotal accounts and a few studies in the literature on schizophrenic disorder which suggest that cognitive appraisal processes in schizophrenic patients may tend to magnify the stressfulness of events and situations. For example, Grant, Gerst, and Yager (1976) found that a psychiatric patient group (21 percent DSM-II schizophrenic patients) generally assigned greater social readjustment weights to life events than normals. Thus, they anticipated more stress from a life event than did the controls. One event “marital separation,” although ranked fourth by both groups, was perceived by patients as 35 percent more stressful. In another study by Gerst and colleagues (1978), normals showed good temporal stability in their ranking and magnitude estimations of the stressfulness of life events prospectively over a 2-year period. However, the patient group was quite unstable in their item ratings. The authors hypothesized that the instability of ratings could have reflected fluctuations in symptomatic state resulting in greater ratings of required readjustment in response to stressors when the patient felt distressed.

Psychoanalytic and information-processing theories of schizophrenic thought patterns also suggest that reliance on idiosyncratic meanings and interpretations of events increases with the severity of disturbance (Shean 1982). Heightened sensitivity to stimuli coupled with increasing bizarre idiosyncratic thinking, e.g., referential meanings and persecutory ideas, could lead schizophrenic patients in the direction of overreacting to perceived or existing threats, thereby contributing to increased levels of stress. Although much of what has been written is anecdotal, a typical clinical observation follows:

Those who have worked extensively with schizophrenics know that these patients are extremely sensitive. They are very easily hurt by even slightly aggressive or rejecting behavior by others—behavior that, in most cases, would hardly be noticed by a person of normal sensitivity or, if noticed, certainly would not lead to traumatic experiences. [Lehmann 1980, p. 1154]

As reported in the earlier section on life events, some studies of events preceding hospitalization of depressed and schizophrenic patients have found that many schizophrenic patients decompensated in the context of life situations with no clear or identifiable life event stressor (Beck and Worthen 1972). In a study by Shean and Faia (1975), patients were asked to imagine fear-arousing situations. The process-nonparanoid patients used ordinary daily occurrences such as crossing the street on the hospital grounds, taking a trip to the local shopping center, and a thunderstorm.

Thus, the studies reviewed above suggest that schizophrenic patients may show greater variation over time than other populations in their cognitive appraisal of the stressfulness of events. During periods of symptomatic exacerbation they may be particularly prone to view events and situations that are independently...
judged as nonhazardous to be subjectively threatening. The overevaluation of the threatening implications of major and minor life events and difficult interpersonal situations could enhance the inherent stressfulness of such occurrences.

Cognitive control strategies. The processes that people use to modulate their stress level by actively reinterpreting the meaning of the difficulty have been termed cognitive control strategies. In laboratory studies on stress, Lazarus and Alfert (1964) found that when the cognitive strategies of "denial" and "intellectualization" were used during the viewing of a stressful film by subjects trained in these techniques, their arousal level was significantly lower than in untrained subjects. Denial can be viewed as a conscious effort to remove from awareness certain fear-arousing elements and characteristics of an event or situation to minimize emotional distress. Hackett and Cassem (1973) found that denial decreased anxiety among myocardial infarction patients in an acute coronary care unit. However, other studies have found that cardiac patients who used denial also tended to delay seeking treatment and later failed to comply with medical regimens, which Krantz (1980) considered as further manifestations of their use of denial as a cognitive coping strategy. Ultimately, such noncompliance decreases the probability of a successful long-term recovery.

A phenomenon similar to denial, that of "sealing over," refers to a style of coping with an initial schizophrenic episode (McGlashan, Levy, and Carpenter 1975). Schizophrenic patients who were considered to have "sealed over" the occurrence of their illness retained a magical quality to their thinking and denied that anything important had happened. Patients who were considered "integrators" tended to accept their vulnerability to schizophrenic illness and attempted to understand the causes of their psychotic episode. Thus, "sealing over" may represent a cognitive coping strategy similar to denial which some schizophrenic patients use to manage the acute stress of having had an episode of a major mental disorder. Followup data by McGlashan and Carpenter (1981) did not show a relationship between these two styles of perceiving psychotic episodes and outcome. However, they found that a "realistic" attitude toward the illness and the future predicted a good outcome better than did either unrealistically negative or overly positive distortions. Thus, a cognitive control strategy which involves approaching the illness as a significant event without overdramatizing its positive or negative consequences may enable the patient to cope with the stressfulness of the illness and facilitate long-term recovery better than denial. These results parallel the finding of Van Putten, Crumpton, and Yale (1976) that the patients who refused medication and required more frequent hospitalization were rated higher on grandiosity. Denial of illness is often part of the clinical picture of grandiose patients. As with the myocardial infarction patients, reliance on denial as a dominant cognitive coping strategy may lead to noncompliance with medical regimens and, hence, poorer outcome.

Another factor that has been found to be associated with effective coping is the individual's self-concept in areas such as locus of control, sense of mastery, self-esteem, and personal efficacy (Moos and Billings 1982). Pearlin and Schooler (1978) found that freedom from self-denigration, a sense of control over impinging forces, and favorable attitudes toward self ameliorated the impact of emotional strain from perceived marital, parental, financial, and occupational stress. Among cancer patients, ego strength was found to be related to both psychosocial adaptation (lowered feelings of vulnerability and disturbance of mood) and use of effective coping strategies (seeking information, redefining problems, and avoidance of blaming) (Worden and Sobel 1978).

Fitts (1972) found that the Tennessee Self-Concept Scale profiles of DSM-I schizophrenic patients indicated low self-esteem and poor self-concept integration. The schizophrenic patients perceived themselves as persons of little worth or social desirability. The mean Total P score, which reflects overall self-esteem level, of "schizophrenic reaction, simple type" patients fell near the 8th percentile of standardized group norms. Eighty-four percent of this group scored below the standardized mean. Although there are many alternative formulations, Mechanic (1974) has defined stress as the individual's perceived inability to meet life demands. With the possible exception of paranoid subtype patients, most schizophrenic patients have been found to have a lower level of self-esteem, a finding which suggests that they would more readily perceive themselves as inadequate to handle the demands generated by life events and ongoing stressful situations.

Summary. Several factors contribute to the hypothesized inadequate cognitive coping strategies of schizophrenic patients. They may overevaluate the threatening potential of both major life events and daily hassles. Low self-esteem could contribute to schizophrenic
patients perceiving themselves as less capable of resolving problematic situations. Overappraising the external demands and underappraising their internal resources could add to the level of stress that schizophrenic patients experience following life events and familial difficulties. In addition, many schizophrenic patients seem to rely on a very limited number of cognitive coping strategies, particularly denial. These strategies may be useful in the short-term management of anxiety, but are probably unproductive for the long-term resolution of stressful situations such as marital difficulties or recovery from a psychotic illness. Although possibly amenable to retraining, the cognitive coping strategies that are often used by schizophrenic patients seem likely to render them more vulnerable than most people to the impact of stressors.

Behavioral Coping. Behavioral coping entails the application of cognitively generated problem-solving options in behavioral action aimed at modifying, resolving, or eliminating the source of the stressful experience (Gal and Lazarus 1975; Zubin and Spring 1977; Pearlin and Schooler 1978; Ilfeld 1980). Behavioral coping can be viewed as a two-step problem-solving task. First, perceptual and cognitive abilities are required for the “receiving” and subsequent “processing” of relevant interpersonal stimuli in order to generate and select alternatives. Second, social skills are required for the “sending” of appropriate messages during the implementation of solutions. This section reviews basic cognitive problem-solving skills required to generate effective alternatives, and then the social skills necessary to implement solutions. Each review highlights studies in which schizophrenic patients have been shown to exhibit deficiencies that affect their ability to use effectively both the cognitive and social skills required in behavioral coping.

Generating alternatives. Spivack, Platt, and Shure (1976) identified six cognitive abilities required for solving interpersonal difficulties: problem recognition, generating options, means-ends thinking, causal thinking, perspective taking, and considering consequences. Other researchers agree with the importance of the cognitive components in problem solving and list similar skills (D’Zurilla and Goldfried 1971; Trower, Bryant, and Argyle 1978). In a series of studies, Platt and coworkers administered the means-ends problem-solving task to large populations of psychiatric patients, many of whom were schizophrenic. Patients were found to be deficient in most of the cognitive skills necessary for problem solving in comparison with normals. Patients generated fewer alternatives, less effective alternatives, and a lower ratio of relevant to total alternatives (Spivack, Platt, and Shure 1976). One study by Platt, Siegal, and Spivack (1975) found that psychiatric patients were as accurate as a comparison group of normals in recognizing the best alternative. However, patients were less able to provide a valid reason for choosing a particular alternative, and were less able to generate and evaluate the consequences of an alternative. Deficiencies in problem-solving skills have been found to be associated with both a poor premorbid history (Platt and Spivack 1972) and with elevated scores on the Pa, Sc, and F scales, and the Goldberg Index (a measure of risk factors for psychosis) on the Minnesota Multiphasic Personality Inventory (MMPI) (Platt and Siegal 1976). Unfortunately, none of these studies were conducted with a population consisting exclusively of schizophrenic patients, nor have there been any rigorous prospective studies that examined the relationship between problem-solving skills and the prediction of outcome. Nevertheless, they constitute suggestive evidence that schizophrenic patients are generally deficient in cognitive problem-solving skills, and that such skills may be related to outcome among schizophrenic patients.

In addition to these specific problem-solving skill deficits, there are other well-documented basic disturbances in the attentional, perceptual, memory, and thinking processes of schizophrenic patients. Common deficiencies observed among schizophrenic patients include difficulty with sustaining focused attention over time, slowed processing of simple stimuli, overloading of information when stimuli are complex, distractibility during effortful processing, and ineffective use of active mnemonic strategies (reviewed briefly by Liberman, Nuechterlein, and Wallace 1982, and more extensively by Nuechterlein and Dawson 1984b, this issue). The combination of specific problem-solving skill deficits with more basic impairments in cognitive functioning has the potential to create a severe decrement in the problem-solving ability of schizophrenic patients.

Most life events result in problematic situations such as a loss in social support or material resources. The research of Platt and coworkers indicates that many schizophrenic patients begin the task of resolving stressful situations with deficient problem-solving skills. In addition, the stress induced by life events or ongoing familial tension might create sensory and information overload, thereby further impairing their problem-solving skills just when the
application of problem solving is needed most. Given schizophrenic patients’ impaired ability to generate effective behavioral alternatives, the stressful situation is likely to persist or even worsen.

Implementing alternatives. Once a behavioral alternative has been generated and decided upon, the second phase of behavioral coping begins and involves the application of social skills in order to implement the solution. Wallace (1982) has identified “sending” skills that are necessary for the implementation of goal-oriented problem solving (e.g., asking for a raise or renting an apartment) and for the resolution of interpersonal problems (e.g., expressing anger appropriately). In this implementation phase of behavioral coping, schizophrenic patients show both specific nonverbal and verbal sending skill deficits as well as other general social skill deficiencies that could impair instrumental functioning and the resolution of interpersonal stress. Wallace (1984, this issue) has reviewed the literature pertaining to the sending skills deficits of schizophrenic patients. In spite of the lack of consensus on what constitutes socially skilled behavior, it is generally acknowledged that paralinguistic elements of speech (e.g., eye contact, voice volume, and fluency) are important in communicating the meaning of messages (Bellack 1979). Schizophrenic patients have been found to show deficient or excessive levels on these nonverbal dimensions in comparison to normal subjects (Eisler et al. 1975; Hersen, Bellack, and Turner 1978). In addition, numerous studies have revealed inadequacies in the quantity and quality of speech of schizophrenic patients that are not due to their inability to understand or use the rules of speech. Instead they appear to be due to information-processing deficits, e.g., failure to self-edit and eliminate inappropriate verbalizations, impaired ability to produce associations to arrive at a correct verbalization, and failure to take account of the listener’s cognitive context (Cohen 1978). This results in the production of clauses with ambiguous referents that are confusing for listeners (Rochester 1978). Therefore, the overall understandability of schizophrenic speech is impaired. Schizophrenic patients with impaired ability to communicate would be more prone to have difficulty during the implementation phase of problem solving, because that phase usually involves interpersonal interaction.

Schizophrenic patients may also be deficient in the ability to recognize basic emotions, another social skill that Wallace (1982) has hypothesized to be critical in problem solving. In addition, the timing and appropriateness of self-disclosing statements may be disturbed among schizophrenic patients (Levy 1976). Thus, schizophrenic patients seem to show impairments in basic sending skills as well as higher level social skills that are necessary for effective social interaction.

Wallace (1984, this issue) notes that a number of studies have found a lower rate of social interaction among schizophrenic patients compared with nonschizophrenic populations, with the rate for chronic patients being particularly low. In fact, the preferred rate of interaction among schizophrenic patients may be lower than among most people. Yet, social interaction seems to play an essential role in resolving interpersonal stressors and attaining instrumental goals. Pearlin and Schooler (1978) have found that remaining committed and involved in interpersonal relationships when problems arise is a critical component of effective coping. Mechanic (1974) has maintained that developing competency in behavioral coping requires practice and experience in applying the composite skills. Thus, even social skills that were once part of a schizophrenic patient’s repertoire might drop out due to nonuse (Liberman 1982). A lowered rate of social interaction and lowered preferences for affiliation could retard the development, practice, and use of social skills, thereby reducing the behavioral coping competency of schizophrenic patients.

Summary. Rectifying the changes and losses brought on by life events and resolving the sources of familial tension usually require the development of behavioral “plans of action” and the use of skilled social interactions to implement the cognitively generated solutions. Behavioral coping deficiencies among schizophrenic patients seem to occur during both stages of this problem-solving process. In the first phase, the processing of behavioral alternatives may be hampered by deficits in cognitive and information-processing abilities. During the second phase, the implementation of solutions may also be impaired by specific “sending” skill deficits and other basic social skill deficits. As reviewed in the previous section, when faced with stressors, schizophrenic patients may be less able to cope cognitively to control the perceived stressfulness of the situation. The research reviewed in this section suggests that many schizophrenic patients are also less competent than nonschizophrenic persons at coping behaviorally to alter the stressful conditions directly. This combination of coping inadequacies may result in situations in which the impact of stressors is experienced more intensely and
Social Support Recruitment. While life events are viewed as environmental factors that can negatively affect the course of schizophrenic disorder, social support is a positive environmental factor that may serve as a buffer for stressful life events and situations, thereby attenuating the likelihood of schizophrenic relapse. Social support has been variously defined. In an extensive review of studies of social support, Cobb (1976) defined it as “information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations” (p. 300). Caplan (1981) defined social support as a form of cognitive guidance:

> Psychological stress may increase an individual’s vulnerability to mental and physical illness; this may be prevented if the individual receives social support in mastering the stressful situation in the form of cognitive guidance. Cognitive guidance compensates for the reduction in the individual’s problem-solving capacity caused by stress-induced emotional arousal. [p. 414]

Beels (1981), on the other hand, gave a much broader definition of social support for schizophrenic patients, e.g., “whatever factors there are in the environment that promote a favorable course of the illness” (p. 60). In a recent review, Hammer (1981) has summarized definitional differences, noting that there is probably some consensus on the basic notion of social support, for although usages do differ, social support is always conceived of as contributing positively to the individual.

A substantial body of evidence does indicate that in many life situations social support functions as a mediator of life events. Caplan (1981), Cobb (1976), and Pilisuk and Froland (1978) have reviewed studies of the role of social support and life stress in complications of pregnancy, hospitalization, psychiatric symptoms, recovery from illness, unemployment, bereavement, and aging. Studies in these areas generally support the hypothesis that social support protects against increased vulnerability to illness associated with high stress.

Only a few studies have been completed which describe the social support systems of schizophrenic patients or answer the specific question of whether social support affects the course of schizophrenic illness. The existing studies generally show that schizophrenic patients have smaller social networks than normal comparisons (Pattison et al. 1975). In a study of residents of single-room-occupancy hotels in New York City, Sokolovsky et al. (1978) reported smaller networks for schizophrenic patients with moderate to severe residual symptoms than for nonresidual schizophrenic residents in the same hotels, but no difference between schizophrenic patients with minimal or no residual symptoms and the nonresidual schizophrenic residents. The authors also found that the likelihood of rehospitalization for the schizophrenic patients was related to the size of their social networks for patients with minimal or no residual symptoms. This study, although the only one of its kind and in need of replication, suggests that the smaller social networks found among many schizophrenic patients could negatively affect the course of their illness.

In addition to the size of the network, a second issue in understanding the social support systems of schizophrenic patients concerns the composition and quality of relationships in their networks. Several studies have shown that the social networks of schizophrenic patients usually contain a significantly higher proportion of relatives (Tolsdorf 1976; Garrison 1978; Randolph and Escobar 1982). Yet, these same studies indicate that reliance on relatives may not offer as much protection during stressful events as a more broadly constituted social network. The schizophrenic patients in Tolsdorf’s (1976) study reported significantly less confidence in the ability of their networks, which contained a high proportion of relatives, to help them in times of crisis than did the comparison group of medical inpatients. Garrison (1978) studied social support systems of Puerto Rican female schizophrenic patients with varying degrees of emotional disturbance. She concluded that “the salient finding of this analysis is that there is greater reliance upon neighbors, friends and other non-kin than upon family among the schizophrenic women who lead their lives relatively successfully within the community” (p. 594). An ongoing study by Randolph and Escobar (1982) is focusing on social networks and social supports of Anglo and Hispanic male schizophrenic individuals under the age of 42 in Los Angeles. Preliminary results indicate that for both Anglos and Hispanics, the larger the ratio of friends to kin in the network, the better the individual’s adjustment. They also report that large networks dominated by kin may actually be more dysfunctional than relatively smaller networks dominated by friends. Their preliminary findings concerning the benefits of a high proportion of friends within the social network are consistent with Garrison’s description of networks of
Puerto Rican schizophrenic women in New York.

A related hypothesis by Hammer (1981) concerns the finding that less than 35 hours a week of contact with intrusive, overstimulating relatives (high EE relatives) reduces schizophrenic relapse rates (Vaughn and Lefl 1976a; Vaughn et al. 1982). Hammer suggests that this may represent not only time not spent with these relatives, but additionally, time spent with friends in networks available for social support. These findings suggest that the high proportion of relatives comprising the social support networks of many schizophrenic patients may diminish the overall effectiveness of their social support systems in coping with stressful events. In addition, the constricted range of social outlets does not help a schizophrenic patient to cope with any ongoing familial tension because the patient may lack outside alternatives for social contact.

Beels (1981) notes that it may be difficult to apply certain useful concepts of social supports to schizophrenia, such as the idea of the "confidant": "A confiding relationship, especially with a spouse, has been shown to be a protective social support in a variety of conditions, from depression (Brown and Harris 1978) to heart disease (Medalie and Goldbourt 1976). But a confidant may be a very problematic person for a schizophrenic" (p. 61). Indeed, the investigations of schizophrenic patients' social networks by Lehmann (1980) and Lipton et al. (1981) showed positive correlations between ex-patients' favorable social functioning and casual rather than intimate relationships. On the basis of these results, Liberman (1982b) has hypothesized that a quiet, undemanding, somewhat isolated social experience may be a supportive one for chronic schizophrenic outpatients.

Summary. The evidence available indicates that many schizophrenic patients rely on smaller networks consisting of a higher proportion of relatives than typical nonschizophrenic persons. Both of these characteristics have been found to be associated with greater likelihood of rehospitalization. Although many schizophrenic patients may benefit from expanding the size and variety of their social networks, one should not immediately assume that the goal for this population would be to expand their social networks greatly and increase the intimacy of their relationships. Casual friendships rather than intimate relationships seem to have a more positive effect on the course of schizophrenic illness.

The recruitment of social networks is being considered a coping response in this article because it is within the patient's control and it mediates the impact of stressors. Yet, as a coping response, it has some distinct qualities. Since cognitive and behavioral coping both involve responding directly to and during the stressful situation, they are vulnerable to what Zubin and Spring (1977) have termed "coping breakdown." Some patients who seem to possess adequate coping skills during periods of remission lose these skills just as stress mounts and the use of coping responses is most critical. A type of spiraling may ensue with increasing arousal, attention fractionation, and symptom exacerbation, which in turn can contribute to the creation of stressful events and tension in relationships. Such a pattern with feedback loops is hypothesized to precede the development of many relapses (Dawson, Nuechterlein, and Liberman 1983; Nuechterlein and Dawson 1984a).

However, a social network, once in place, may function even during times of "coping breakdown." Thus, schizophrenic patients whose social skills are impaired by the onset of symptoms but who possess adequate skills and have used them to recruit a social network during periods of remission might be able to create a protective buffer between themselves and relapse. This would make recruitment of a social network a particularly critical coping response for schizophrenic patients prone to periods of "coping breakdown."

Conclusions

The studies reviewed in the first two parts provide strong empirical support for a vulnerability/stress model of the course of schizophrenic disorder. When persons who are vulnerable to schizophrenic disorder are exposed to socioenvironmental stressors in the form of independent and nonindependent life events that cluster in the span of a few weeks, the likelihood that they will develop a schizophrenic episode seems to be increased. Schizophrenic patients living in "stressful" families that are characterized by high criticalness, intrusiveness, and overinvolvement also have a greater likelihood of relapsing. Finally, communication deviance measured in parents predicts and might be involved in the onset of schizophrenia spectrum disorders.

However, the fact that life events and family atmosphere may play a role in triggering the onset of schizophrenic episodes tells us very little that is unique about the nature of schizophrenic disorders. An elevated incidence of life events has been found to precede the onset of virtually all medical and psychiatric disorders studied (Rahe and Arthur
1978). Nor do the types of life events which precede the onset of schizophrenic episodes seem qualitatively different from those reported by other psychiatric patients (Rabkin 1980). The findings regarding family atmosphere and course of illness are not specific to schizophrenia either. Elevated CD scores have been found in parents of mentally retarded children (Wender et al. 1977), and high EE in the family has also been found to be related to the onset of depression (Vaughn and Leff 1976a).

Stress seems to act as a general precipitant which results in varying symptomatology depending upon genetic and acquired vulnerability. Yet, this review of the research on life events and familial stress as well as the coping response literature has uncovered some aspects of the relationship between stress and the course of illness that seem specifically characteristic of schizophrenia. First, schizophrenic patients seem to be highly stress-prone. Their vulnerability to schizophrenic disorder, residual persisting symptoms, prodromal early onset symptoms, lifestyle, goals, hereditary links to other persons with schizophrenic disorders, socioeconomic status as psychiatric patients, and the treatments they receive for their illness all seem to predispose schizophrenic patients to a higher incidence of life events than persons without this disorder. In addition, the family atmosphere of many schizophrenic patients is characterized by criticalness and intrusiveness. Faulty communication patterns in many of their families may also contribute to ongoing tension.

Second, when faced with the occurrence of life events or residing in a stressful family atmosphere, schizophrenic patients seem less adept than most persons at coping skillfully to resolve the environ-

mental threat through behavioral coping techniques, to reduce their resulting stress level through cognitive coping techniques, or to recruit social support during times of crisis. From these findings, two implications will be drawn—one regarding future research, and the other regarding the treatment of patients with schizophrenic disorders.

**Future Research.** The studies conducted to date on familial factors have opened several promising new avenues for understanding psychosocial dimensions that influence the course of schizophrenic disorders. Several different instruments and indexes have been used in this research, and therefore it is important to clarify the relationships among the various family measures. This could be accomplished by administering multiple family measures to the same subject samples. The development of abbreviated, clinically oriented versions of the key family assessment instruments that are relatively easy to administer would also aid the process of conducting research with families.

Another key question requiring study concerns the specificity of parental EE and AS to the patient. Brown, Birley, and Wing (1972) have made the following suggestion:

> The same relative would not necessarily respond to other people in the same way . . . the measure reflects a quality of relationship with a particular person (the patient), not a general tendency to react to everyone in a similar way. [p. 241]

Research designs that included assessment of parents' attitudes and behavior toward the patient as well as toward a sibling would help to address this specificity issue.

If this specificity to the patient-relative were to be empirically demonstrated, research on EE might also profitably search for patient characteristics that may play a role in eliciting high EE from relatives. The possibility that high EE develops through a transactional process between patient and parent deserves further exploration. To date, EE researchers have shown that some patient variables do not play a strong mediating role, such as an index measuring level of behavioral disturbance (Brown, Birley, and Wing 1972). However, this should not limit the search for other intervening variables.

Similarly, because EE research has shown that the amount of face-to-face contact with high EE relatives and the presence of antipsychotic medication serve as moderating variables in predicting the outcome of EE, additional consideration should be given to patient variables that might be related to medication compliance and contact with relatives. For example, a high level of residual disability might help to stimulate high relative contact. The EE research to date has relied on naturalistic observations without manipulation of these key moderating variables. The use of experimental designs would help to clarify whether patient variables interact with EE to predict outcome.

A related design question concerns the possible reactivity of CD to certain disturbances in the patient offspring. As mentioned earlier, Wender et al. (1977) found elevated CD among patients of mentally retarded individuals. The project by Goldstein and his colleagues selected as subjects adolescents who had not experienced psychosis but who were showing some emotional or behavioral disturbance. Because not all the parents of these disturbed adolescents showed high CD, it appears that disturbances in offspring
at least do not universally elicit these communication anomalies. It would be a very useful additional study (although tactically demanding) to demonstrate that parental CD, measured in a sample of well-functioning offspring relatively early in their lives, has predictive value for schizophrenia spectrum disorders. The last three of these suggestions would lead research on familial atmosphere and behavior into a more transactionally oriented direction with increased attention to patient variables that might play a role in eliciting high EE or CD from relatives and/or in mediating their effects on the patients.

Another promising strategy for clarifying causal relationships between EE, AS, and CD and the course of schizophrenic disorders is to evaluate the effect on illness course of interventions that are aimed at changing these parental attitudes and behaviors. Increased interest in family education and other family interventions may dovetail with the need to evaluate further the causal networks that underlie the predictive relationships that we have reviewed here.

A major weakness of life events research has been its limitation to a two-variable design. Life events are recorded (usually retrospectively) and subjects are rated on the presence or absence of the onset of the illness. This narrow methodological focus is not unique to studies on schizophrenia, but has been the primary approach adopted by researchers in the life events field. Two of the originators of this paradigm have recently argued that it is time for a change:

We believe that further studies of an epidemiological character which correlate life events and illness will be redundant. Instead, the enormously difficult task awaits us of filling in the crucial steps of an all-encompassing model which takes into account not only environmental variables but the sociological, psychological, and physiological characteristics of the individual. [Rahe and Arthur 1978, p. 13]

In schizophrenic disorders, the need to understand the mediating variables is especially important because the relationship between life events and psychotic symptoms, although measurable and usually statistically significant, is not very powerful. Schwartz and Myers (1977) found that in their sample of 132 posthospitalized schizophrenic patients, life events exerted their greatest impact on nonpsychotic symptoms such as anxiety and depression. Life events explained only 10 percent of the variance in the schizophrenia score, which included symptoms such as grandiosity, delusions, and looseness of association. When only independent life events were considered, they accounted for merely 4 percent of the variance. Similarly, Harder et al. (1980) found life events variables explained only 3–7 percent of the variance in symptom measures among their sample of first-admission patients. Other studies have suggested that the impact of life events on the course of illness may, in fact, be less for schizophrenia than for other types of psychiatric disorders. Using the concept of relative risk, Paykel (1978) reviewed many of the published studies on depression, schizophrenia, and suicide attempts for which the risk of illness associated with the occurrence of life events could be computed. He concluded:

The occurrence of any of the spectrum of events included in these studies increases the risk of developing a schizophrenic illness in the next 6 months by something of the order of 2 or 3 times; of depression by 2–5, and of a suicide attempt by about 6 times. . . . There is some consistency between studies that the effect is greater for depression than schizophrenia. [p. 251]

The many methodological problems that might affect the statistical association between life events and the onset of schizophrenic episodes were reviewed in a previous section of this article, and many of them are unique to schizophrenic disorders. However, a study by Tausig (1982) indicates that focusing primarily on resolving methodological obstacles may not improve the magnitude of the relationship between life events and schizophrenic episodes. He investigated the impact of a variety of methodological issues often cited as hampering findings of the etiologic role of life events on illness: scope of item content, multidimensional structure, confoundedness with dependent variable, objective-subjective scoring, and desirability. After examining the effect of each of these factors on the relationship between life events and depressive symptomatology, he concluded that, "even when different ways of evaluating life events are considered, the relatively small relationship to depressive symptoms cannot be improved substantially" (p. 52).

The implication we draw from Tausig's findings corroborates Rahe and Arthur's (1978) point that future research should be directed toward uncovering the intervening variables that mediate the effect of life events on the onset of schizophrenic episodes. This article reviewed coping responses as one avenue that shows promise for exploration. Other articles in this issue focus on psycho-physiological and cognitive processing factors which also seem to
be variables that are likely to intervene between the occurrence of socioenvironmental stressors and the development of schizophrenic episodes.

Clinical Interventions. The treatment implications that can be drawn from this review involve the remediation of coping skill deficiencies that were delineated in the third section of the article, as well as the reduction of particularly toxic socioenvironmental stressors uncovered in the first and second sections. To use an analogy to physical illness, coping responses are similar in function to an organism's "host resistance"—the natural or acquired immunity to an infectious disease that enables the organism to withstand an infectious challenge. Cognitive and behavioral coping and social support recruitment are the counterparts at the psychological level to the organism's resistance. They enable a person to withstand socioenvironmental challenges. The interventions that have been found promising in preventing relapse among schizophrenic patients can be viewed as programs that train patients to improve their coping response skills, e.g., social skills training (Wallace 1984), and problem-solving (Falloon et al. 1982). Thus, to carry the analogy further, successful social skills and problem-solving skill training are comparable to the vaccinations that medicine uses to improve an organism's resistance to infectious agents.

Liberman, Falloon, and Aitchison (submitted for publication), in their review of the family therapy intervention conducted at Camarillo State Hospital, demonstrated that when families are trained in problem-solving and communication skills, high EE can be reduced. Patients from families that participated in the family therapy program had a lower relapse rate, which might be partly attributable to the reduction in the stressfulness of the family environment. Based on the findings from the life events and familial stress research, environmental interventions for schizophrenic disorders should be aimed at (1) reducing the stressfulness of the patient's family through family therapy focused on problem-solving and communication skills, and (2) creating for schizophrenic patients or helping them to create stable residential environments outside of the family that avoid the extremes of understimulation and overstimulation, both of which seem to have detrimental effects on the course of schizophrenic disorders.

Studies conducted during the past 25 years on life events, familial stress, and coping responses have uncovered some major socioenvironmental factors and some crucial skills deficits which seem to affect the course of schizophrenic disorders. Using these findings to guide empirically the development of psycho-social interventions can aid efforts to improve the quality of life and outcome of patients with this illness.

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