Suicidal Children Grow Up: Suicidal Behavior and Psychiatric Disorders among Relatives

CYNTHIA R. PFEFFER, M.D., LINA NORMANDIN, PH.D., AND TATSUYUKI KAKUMA, PH.D.

ABSTRACT

Objective: This paper reports comprehensive data on psychiatric symptoms and disorders and medical problems of first- and second-degree biological relatives of prepubertal children who have contemplated or attempted suicide. **Method:** Standard family study and family history interview techniques were used to obtain information about psychopathology and medical illness in 488 first- and 1,062 second-degree relatives of 25 child psychiatric inpatients who reported suicide attempts, 28 child psychiatric inpatients who contemplated suicide, 16 nonsuicidal child inpatients, and 54 normal children. **Results:** Suicidal behavior in children was associated with suicidal behavior in their families, although no first-degree relatives committed suicide. More first-degree relatives of child suicide attempters, compared to first-degree relatives of normal children, had antisocial personality disorder, assaultive behavior, and substance abuse. Mood disorders in first-degree relatives were not associated with child suicidal behavior. No significant associations were identified for psychopathology of second-degree relatives and child suicidal behavior. **Conclusions:** The results suggest the importance of evaluating familial psychopathology during assessments of suicidal children. Self-directed and externally directed violence, antisocial personality disorder, and substance abuse of relatives of suicidal children should be studied to elucidate the etiology of youth suicidal behavior. *J. Am. Acad. Child Adolesc. Psychiatry,* 1994, 33, 8:1087–1097. **Key Words:** suicidal children, family psychopathology.

Research on risk factors for suicidal behavior among children and adolescents has burgeoned in recent years. It is apparent that youth suicidal behavior is complex and involves multiple psychiatric and sociocultural variables related to mood, substance abuse and disruptive disorders, impulsivity, violence, poor social adjustment, and stressful life events (Alcohol, Drug Abuse, and Mental Health Administration, 1989). Sparse research data exist, however, about family characteristics, especially psychological dysfunction among relatives of suicidal children and adolescents. This information is important for elucidating groups of vulnerable youth for whom prevention and early intervention strategies can be developed. It is essential for suggesting underlying mechanisms involving genetic and neurophysiological and other biological factors associated with the etiology of youth suicidal behavior.

This paper reports unique comprehensive psychiatric data on first- and second-degree biological relatives of prepubertal children who have contemplated or attempted suicide. These relatives were compared to first- and second-degree biological relatives of prepubertal nonsuicidal children to study the hypothesis that suicidal behavior in children is associated with suicidal behavior, mood disorders, alcohol and substance abuse, and antisocial factors involving violence among relatives.

Systematic comparative investigations of suicidal behavior among families of adults using familial, twin, and adoption methodologies suggest that suicidal behavior

Accepted March 2, 1994.

Dr. Pfeffer is Professor of Psychiatry, Cornell University Medical College, and Chief, Child Psychiatry Inpatient Unit, New York Hospital-Westchester Division, White Plains, NY. Dr. Normandin is Associate Professor of Psychology, University Laval, Quebec, Canada. Dr. Kakuma is Instructor in Biostatistics in Psychiatry, Cornell University Medical College, White Plains, NY.

This study was supported by USPHS grant MH 142120 from the National Institute of Mental Health, 1987–1990. The authors gratefully acknowledge the research assistance of Mary Kay Aebly, Ph.D., Jennifer Ackerman, Ph.D., Joan Peskin M.A., Chantale Pichard, M.A., Carol Siefker, M.A., Dayna Bandman, Rebecca Bloom, Lisa Londin, Akin Popoula, John Rozel, and Stephen Terracciano.

This paper was presented at the 40th annual meeting of the American Academy of Child and Adolescent Psychiatry, San Antonio, TX, October 26–31, 1993.

Reprint requests to Dr. Pfeffer, New York Hospital-Westchester Division, 21 Bloomingdale Road, White Plains, NY 10605.

"runs in families" and that it may have an underlying genetic component. These studies report a strong relationship between suicidal behavior and affective disorders in relatives. For example, Murphy and Wetzel (1982) noted that among 127 randomly selected patients admitted to a general hospital after a suicide attempt, 25% reported a family history of suicide attempts and 14% of the sample had a family history of suicide. Suicide among relatives was most prevalent among patients with a personality disorder or an affective disorder. Pitts and Winokur (1964) noted among 748 consecutively admitted psychiatric patients that 37 (4.9%) reported suicide in a first-degree relative. Twenty-five (68%) of 37 first-degree relatives who committed suicide had an affective disorder. Furthermore, the index patients of 24 of these relatives also had an affective disorder. These findings were similar to those reported by Roy (1983) for 5,845 psychiatric inpatients, among whom 243 (4.2%) had a family history of suicide. A significantly greater number of patients who had a family history of suicide reported their own suicide attempts. Furthermore, 56.5% of patients with a family history of suicide had an affective disorder.

In a follow-up study, Roy (1982) reported a high prevalence of suicide in the families of patients who later committed suicide. Similarly, the Iowa 500 follow-up study (Tsuang, 1983) highlighted a four times greater risk for suicide among first-degree relatives of patients who committed suicide than among first-degree relatives of patients who did not. When psychiatric diagnoses of these patients were considered, the morbidity risk (Bezugsziffer [BZ]) for relatives of patients with depression who committed suicide (10.2%) was significantly higher than for those who did not commit suicide (3.0%). Morbidity risk (BZ) of relatives of manic patients who committed suicide (9.4%) was higher than for those who did not (0.9%). In contrast, relatives of schizophrenics who committed suicide and those who did not had low morbidity risks (BZ) of 0% and 1.2%, respectively.

Egeland and Sussex (1985), studying the unique sample of the Old Order Amish community of Lancaster County, Pennsylvania, suggested a strong family loading of affective disorders and suicide. Seventy-five percent of the 26 suicides that occurred between 1880 and 1980 clustered in four families. Twenty-five (92%) of the suicides had a mood disorder. Other reports of psychiatric patients validate the aggregation of suicidal behavior in probands and their relatives, especially among probands with affective disorders (Bronisch and Hecht, 1987; Linkowski et al., 1985; Mitterauer et al., 1988). However, the results of these studies contrast with those of Scheftner and colleagues (1988), who reported data of the National Institute of Mental Health Collaborative Depression Study and found no greater prevalence of suicide or suicide attempts in relatives of index subjects with affective disorders who committed suicide compared to those who did not commit suicide in a 5.5-year follow-up period.

The above studies supporting a strong familial aggregation of suicidal behavior are supported by results of research on twins. Haberlandt (1967) reported a 17.7% concordance rate for suicide among 51 monozygotic twin pairs, but no concordance for suicide among 51 dizygotic twin pairs. High rates of concordance for schizophrenia and manic-depressive disorder were also noted among monozygotic twins concordant for suicide (Kallman et al., 1949; Juel-Nielson and Videbeck, 1970; Zair, 1981). The strongest evidence for a genetic basis for suicidal behavior is derived from two independent adoption studies conducted in Denmark (Schulsinger et al., 1979; Wender et al., 1986) suggesting a higher rate of suicide (3.7% to 4.5%) of biological relatives of adoptees who committed suicide than the rates of suicide (0.3% to 0.7%) for biological relatives of adoptees who did not commit suicide. However, these studies could not conclude that the genetic transmission of suicidal behavior was independent of the genetic transmission of affective disorders.

Studies of psychiatric symptoms and disorders among relatives of suicidal children and adolescents have not been conclusive and have been limited primarily by lack of systematic assessment of suicidal behavior and other psychopathologies of relatives. None have used adoption or twin study methodology that may yield results suggesting a genetic basis for early-onset suicidal behavior. Most studies of youth have used clinical populations.

Psychological autopsy studies suggest a significant association between adolescent suicide and serious emotional problems of relatives. Shafii and colleagues (1985) found that 60% of 20 adolescents who committed suicide, compared to 24% of 17 nonsuicidal adolescents, had a parent with emotional problems. Shaffer

(1988), reporting data from the New York Psychological Autopsy Study of Adolescent Suicide, noted that a history of suicide attempts or suicide among first- or second-degree relatives increased risk for adolescent suicide by three times. In that study, 41% of 97 males who committed suicide, compared to 17% of 65 normal males, had a family history of suicidal behavior. Thirty-three percent of 17 female suicide victims, compared to 13% of 20 normal females, had a family history of suicidal acts. Brent and associates (1988) found that adolescent psychiatric inpatients who reported a history of suicidal ideation or suicide attempts when compared to adolescent suicide victims had similar but high rates of psychopathology among first-degree relatives. In addition, the relatives of these two groups of suicidal adolescents had higher rates of suicide, major depressive disorder, bipolar disorder, and antisocial personality disorder than were found among adults in the community.

Many reports of nonfatal suicidal behavior in children and adolescents indicate elevated rates of suicidal behavior and psychiatric disorders in their relatives. Kerfoot (1988) reported that 41% of 100 child and adolescent suicide attempter psychiatric inpatients, compared to 20% of 50 nonsuicidal youth inpatients, had a family history of psychiatric illness. Thirty percent of these suicide attempters versus 4% of nonsuicidal youth reported a family history of suicide attempts. Tishler and McKenry (1982) noted that fathers of 46 adolescent suicide attempters evaluated in an emergency service were more depressed and abused alcohol more than fathers of 46 nonsuicidal adolescents seen at the same treatment service. Mothers of these suicide attempters reported more suicidal ideation, higher anxiety, and more alcohol abuse than mothers of nonsuicidal adolescents. A chart review study (Garfinkel et al., 1982) of 505 suicidal children and adolescents admitted to an emergency service also suggested that family history of psychiatric illness, especially alcohol and substance abuse and suicidal behavior, was significantly more prevalent than among 505 nonsuicidal youth admitted to the same emergency facility. Joffe et al. (1988) reported on a community sample of 1,012 adolescents and noted that parental arrest imparted 2.30 times risk for youth suicidal behavior.

Other reports corroborate the association of youth suicidal behavior and a family history of suicidal or violent symptoms. A chart review (Myers et al., 1985) suggested that 25% of 61 prepubertal suicidal psychiatric inpatients compared to 6% of 287 nonsuicidal child inpatients had a family history of suicidal behavior. This result concurs with findings of higher rates of suicidal behavior in first-degree relatives of adolescent psychiatric inpatients who reported suicide attempts (22%) compared to nonsuicidal adolescent inpatients (7.9%) (Brent et al., 1990). Kosky (1983) reported that greater than 60% of 20 suicidal child inpatients compared to 4% of 50 nonsuicidal child inpatients witnessed severe family violence or were physically abused. Pfeffer and associates (1983) suggested that prepubertal psychiatric inpatients who reported suicidal and violent behavior had significantly higher rates of parental suicidal behavior and violence than nonsuicidal psychiatric inpatients. Several other studies (Deykin et al., 1985; Green, 1978; Pfeffer et al., 1988; Rosenthal and Rosenthal, 1984) highlighted significant relations between child and adolescent suicidal behavior and history of physical abuse. Some reports, however (Friedman et al., 1984; Kosky, 1983; Myers et al., 1985), found no differences for family psychiatric disorders between suicidal and nonsuicidal children and adolescents.

Attention has focused on the relationships between suicidal behavior and mood disorders in youth and their families. For example, Puig-Antich and coworkers (1989) suggested that suicidal behavior in children with major depressive disorder was associated with low family rates of major depressive disorder. In addition, the first-degree relatives of suicidal depressed children, compared to those of nonsuicidal depressed children, had lower rates of dysthymia, alcohol abuse, and antisocial personality. However, antisocial personality disorder among second-degree relatives was significantly positively associated with suicidal behavior in the depressed children. When suicide attempts and suicide in the families of the entire sample of 48 children with major depressive disorder was examined, no pattern could be discerned between suicidal behavior in the children and their relatives. Specifically, the lifetime morbidity risk for a suicide attempt or suicide in first-degree relatives of children with major depressive disorder was 0.05 compared to the morbidity risk of 0.21 for psychiatrically disturbed nondepressed children and 0 for normal children. This study also reported that second-degree relatives of psychiatrically disturbed suicidal nondepressed children had higher rates of

alcohol abuse disorder and antisocial personality disorder than second-degree relatives of nonsuicidal nondepressed psychiatric patients. There was no association between suicidal behavior of these nondepressed children and major depression in their relatives.

In contrast to the above study (Puig-Antich et al., 1989), associations between family mood disorder and child suicidal behavior were highlighted in studies of depressed parents (Orvaschel et al., 1988; Weissman et al., 1984, 1992). Weissman and collaborators (1992) reported that among parents with major depressive disorder, suicidal ideation and suicide attempts were present in 7.2% of their children compared to 1.4% of children of normal parents.

The varied results and limitations of many of these family studies suggest that systematic investigation of psychopathology among relatives of children who report suicidal ideation or suicidal acts at a young age is needed. The present study is a unique controlled investigation of multigenerational familial rates of suicidal behavior and psychiatric disorders of prepubertal suicidal children.

METHOD

Sample

One hundred twenty-three predominantly prepubertal children, who participated in a 6- to 8-year follow-up investigation (Pfeffer et al., 1991, 1992, 1993), were included in this study of relatives. The children included 25 child psychiatric inpatients who reported suicide attempts, 28 child psychiatric inpatients who reported suicidal ideation, 16 nonsuicidal child psychiatric inpatients, and 54 normal children randomly selected from the community. Information about psychopathology and medical illness was obtained for 488 first-degree relatives (parents and siblings) and 1,062 second-degree relatives (grandparents, aunts, and uncles) at the 6- to 8-year follow-up.

Interview Procedures and Research Instruments

After providing written informed consent, children and their parents were interviewed separately at the initial assessment in 1979 to 1982 (Pfeffer et al., 1986) by trained master's-level or Ph.D.-level research psychologists using the Spectrum of Suicidal Behavior Scale (Pfeffer et al., 1979, 1980, 1982, 1986) to identify with high interrater reliability the presence of suicidal ideation or suicide attempts among the children. On the basis of these ratings children were classified into the four groups. Among the 64 children selected from the community, 9 reported suicidal ideation and 1 reported a suicide attempt. These 10 children were excluded from data analyses of the present report.

After giving written informed consent, parents were interviewed at the 6- to 8-year follow-up by trained master's-level or Ph.D.-level research psychologists for lifetime histories of psychiatric symptoms and disorders in themselves and other relatives. The Schedule for Affective Disorders and Schizophrenia-Lifetime Version (Endicott and Spitzer, 1978) was used during semistructured interviews of the parents to evaluate lifetime history of suicidal and assaultive behaviors and psychiatric disorders in the parents. History of medical illness in parents was also obtained. Parents provided information during semistructured interviews using the Family History-Research Diagnostic Criteria method (Andreasen et al., 1977) to provide information about lifetime history of suicidal and assaultive behavior, psychiatric disorders, and medical illness of other first-degree and second-degree relatives of the subjects. When a parent was not available, the Family History-Research Diagnostic Criteria method was used with the other parent, who provided information about the absent parent. The ratings of parents and other relatives' data were used to identify *DSM-III-R* lifetime psychiatric disorders. A best-estimate consensus of suicidal behavior, assaultive behavior, psychiatric disorders, and medical illness was determined by using all data obtained from parents. These consensus ratings were determined independently by pairs of Ph.D.-level research psychologists who were not involved in the interviews.

Statistical Methods

The κ statistic (Cohen, 1960) was used to evaluate interrater reliability in identifying psychiatric symptoms and disorders and medical problems among relatives.

Lifetime morbidity risks per family were calculated separately for mothers, fathers, siblings, and total first-degree relatives and grandparents, aunts and uncles, and total second-degree relatives. These calculations were made by dividing the number of a specific category of relatives with a specific lifetime psychiatric symptom or disorder or medical problem by the total number of a specific category of relatives in the family. This is reported as the mean rate per family for each of the four groups of children. Comparisons of the lifetime morbidity risks for specific forms of psychopathology of the mothers or fathers of the four groups of children were performed with logistic regression analysis. The independent variable in these analyses was the four groups of children covaried with age of relatives. The dependent variable was the rate of the specific form of psychopathology of the relatives such as suicidal behavior, assaultive behavior, mood disorder, etc. Comparisons of lifetime morbidity risks for specific forms of psychopathology for siblings, first-degree relatives, aunts and uncles, grandparents, and second-degree relatives were performed by using general linear regression models where the dependent variable is the average rate over multiple relatives in a family. Post hoc analyses comparing lifetime morbidity risk for specific forms of psychopathology for pairs of groups of children were calculated for the logistic regression analyses using the parameter estimates for the group effect with its corresponding covariance matrix and for the general linear regression models using least-square means.

To provide some degree of comparability for studies of families of prepubertal suicidal children, the Weinberg Shorter Method (Slater and Cowie, 1971) was used to calculate a BZ (Bezugsziffer) for first- or second-degree relatives which indicates the age-standardized morbidity risk. Specifically, in the calculations, the period of risk for suicidal behavior was based on US data for suicide (National Center for Health Statistics, 1993) and included a range from age 15 years to the age of death of an individual. Risk period for assaultive behavior was estimated to be from age 15 years to age 50 years. Period of risk for psychiatric disorders was based on data from the Epidemiological Catchment Area Study (Burke et al.,

1990) that indicates age of onset for psychiatric disorders. These were as follows: mood disorder, age 15 years to 55 years; anxiety disorder, age 6 to 40 years; antisocial personality disorder, age 18 to 40 years; alcohol abuse, age 15 to 50 years; substance abuse, age 15 to 30 years; psychosis, age 15 to 50 years; and other personality disorders, age 15 to 40 years.

RESULTS

Sample

As shown in Table 1, there were no significant differences in distributions of gender, age, race, social status (Hollingshead and Redlich, 1958), or religion for the four groups of children. The children were predominantly male, white, from middle social status and Catholic religion. Average age was approximately 10 years.

The number of relatives and distributions of age and gender are shown in Table 2.

Interrater Reliability

Interrater reliability for consensus ratings of suicidal behavior, assaultive behavior, and psychiatric disorders of relatives was high and significant (range $\kappa = .83$ to .96, $p < .001$) (Cohen, 1960).

Psychiatric Symptoms and Disorders of Relatives

Table 3 and Table 4 indicate the lifetime morbidity risk for psychiatric symptoms and disorders in first-degree and second-degree biological relatives of the four groups of children, respectively.

Although no first-degree relatives committed suicide, significantly more first-degree relatives of child suicide attempters reported suicide attempts than first-degree relatives of either nonsuicidal child psychiatric patients or normal children. The elevated morbidity risk of first-degree relatives of child suicide attempters was attributed primarily to suicide attempts reported by mothers. There was a gradient for rate of suicide attempts among the mothers of the four groups of children. Nearly 50% of mothers of child suicide attempters reported a suicide attempt, compared to more than 25% of mothers of children who reported suicidal ideation and a minimal number of mothers of nonsuicidal child patients and normal children. Twenty-four mothers attempted suicide. Of these 24 mothers, 18 (75%) attempted suicide at some time between the birth of the child and the child's 12th birthday. Five (20.8%) mothers attempted suicide within 5 years of the child's birth and 1 (4.2%) mother attempted suicide after the child was 18 years old. Pearson χ^2 test was used to compare the four groups of children for those who were exposed to a suicidal mother before age 12 years and those whose mothers attempted suicide at another time. There was no significant difference ($\chi^2[3] = 0.737$, $p < .87$). This result suggests that the two time periods when mothers attempted suicide were similarly distributed among the four groups of children. Low rates of suicide and suicide attempts were reported among second-degree relatives, with no significant differences among relatives of the four groups of children.

Significant differences in rates of assaultive behavior, substance abuse disorders, antisocial personality disorders, family discord, and psychiatric hospitalization were identified for first-degree relatives of the four groups of children. Significantly more first-degree relatives of child suicide attempters had an antisocial personality disorder than first-degree relatives of either nonsuicidal child psychiatric inpatients or normal children. Compared to first-degree relatives of nonsuicidal

TABLE 1
Demographic Characteristics of Child Probands

Characteristics	Suicide Attempter ($N = 25$)	Suicidal Ideator ($N = 28$)	Clinical Control ($N = 16$)	Normal Control ($N = 54$)	χ^2 or F	df	p	Significant Paired Groups[c]
Sex (M/F)	18/7	22/6	13/3	39/15	0.86	3	.83	NS
Mean age ± SD (yr)	10.73 ± 1.78	10.72 ± 2.24	10.09 ± 2.90	9.64 ± 1.88	2.40	3	.07	NS
Race (white/other)	20/5	17/11	12/4	37/17	2.58	3	.46	NS
SES (1,2,3/4,5)[a]	15/10	14/14	11/5	24/30	3.72	3	.29	NS
Religion[b]	5/15/4/1	7/11/7/3	4/9/21	10/38/3/3	10.19	9	.34	NS

[a]Hollingshead five levels: 1, 2, and 3 indicate low to middle socioeconomic levels, 4 and 5 middle-high and high socioeconomic levels.
[b]Religion: Protestant/Catholic/Jewish/other.
[c]Significant paired contrasts are as follows: 1 indicates suicide attempter vs. normal control; 2, suicidal ideator vs. normal control; 3, clinical control vs. normal control; 4, suicide attempter vs. clinical control; 5, suicidal ideator vs. clinical control; and 6, suicide attempter vs. suicidal ideator. NS = not significant.

TABLE 2
Demographic Characteristics of First- and Second-Degree Biological Relatives

Characteristics	Suicide Attempter (N = 25)	Suicidal Ideator (N = 28)	Clinical Control (N = 16)	Normal Control (N = 54)	χ^2 or F	df	p	Significant Paired Groups[d]
Mother								
Subjects existing[a]	25	28	16	54	—		—	—
% Subjects analyzed[b]	88.0	92.9	81.3	85.2	1.75	3	.63	NS
Mean age ± SD	(20)[c] 42.00 ± 5.66	(21) 43.95 ± 7.90	(11) 40.64 ± 6.28	(46) 41.09 ± 4.72	1.31	3	.27	NS
Father								
Subjects existing	25	28	16	54	—		—	—
% Subjects analyzed	84.5	89.2	75.0	85.0	3.20	3	.36	NS
Mean age ± SD	(17) 44.64 ± 5.13	(17) 47.94 ± 7.13	(12) 46.42 ± 5.98	(46) 45.88 ± 6.13	0.82	3	.48	NS
Sibs older 18 yr								
Subjects existing	13	28	17	40	—		—	—
% Subjects analyzed	76.9	64.3	70.6	75.0	1.15	3	.77	NS
Mean age ± SD	(13) 21.69 ± 2.95	(28) 25.06 ± 5.77	(17) 26.53 ± 8.50	(40) 22.25 ± 4.07	3.62	3	.02	3,4,6
Sex (M/F)	9/4	13/15	7/10	24/16	3.57	3	.31	NS
Sibs younger 18 yr								
Subjects existing	37	33	9	65	—		—	—
% Subjects analyzed	64.9	48.5	33.3	78.5	15.99	3	.001	2,3
Mean age ± SD	(26) 11.12 ± 3.98	(21) 12.38 ± 4.78	(7) 9.71 ± 3.10	(62) 10.27 ± 4.69	1.33	3	.27	NS
Sex (M/F)	21/16	20/13	3/6	35/30	2.21	3	.53	NS
Grandparents								
Subjects existing[a]	94	109	64	214	—		—	—
% Subjects analyzed	62.8	54.1	48.4	61.8	22.78	3	.000	2,3,5
Mean age ± SD	(35)[c] 71.66 ± 8.21	(49) 70.08 ± 7.14	(15) 74.53 ± 6.10	(78) 68.63 ± 7.84	3.16	3	.03	3
Sex (M/F)	45/49	53/56	32/32	108/106	0.22	3	.97	NS
Uncles & aunts								
Subjects existing	101	114	57	309	—		—	—
% Subjects analyzed	80.2	57.9	49.1	70.9	25.25	3	.000	2,3,4,6
Mean age ± SD	(76) 42.23 ± 10.59	(71) 42.55 ± 10.43	(42) 46.24 ± 8.06	(227) 41.79 ± 10.70	1.33	3	.27	NS
Sex (M/F)	55/46	55/59	32/25	164/145	1.32	3	.72	NS

[a]Maximum number of subjects available for analysis.
[b]Maximum percentage of subjects from whom information is available.
[c]Number of subjects whose age was available.
[d]Significant paired contrasts are as follows: 1 indicates suicide attempter vs. normal control; 2, suicidal ideator vs. normal control; 3, clinical control vs. normal control; 4, suicide attempter vs. clinical control; 5, suicidal ideator vs. clinical control; and 6, suicide attempter vs. suicidal ideator. NS = not significant.

child psychiatric inpatients, significantly more first-degree relatives of children who reported suicidal ideation had an antisocial personality disorder. These results were accounted for primarily by elevated rates of fathers who had antisocial personality disorders. Significantly more first-degree relatives of children who reported suicide attempts or of children who contemplated suicide compared to first-degree relatives of normal children had substance abuse disorders or reported assaultive behavior. The differences in rates of assaultive behavior were predominantly accounted for by rates in fathers. In addition, significantly more first-degree relatives of children who reported suicidal ideation had a substance abuse disorder than first-degree relatives of nonsuicidal child psychiatric inpatients. More first-degree relatives, especially mothers of children who attempted suicide or of children who reported suicidal ideation, had histories of psychiatric hospitalization than mothers of normal children. In addition, mothers of child suicide attempters were more likely to have reported a history of psychiatric hospitalization than were mothers of nonsuicidal psychiatric inpatients. There were significantly higher rates of family discord among families of child psychiatric inpatients than among normal children.

In general, there were no significant differences in presence of psychiatric symptoms or disorders among second-degree relatives of the four groups of children. However, significantly more grandparents of nonsuicidal psychiatric inpatients than grandparents of normal children reported symptoms of alcohol abuse disorder. No other rates of psychopathology of relatives showed significant differences among the four groups of children.

With regard to physical illness, no significant differences on major categories such as heart problems, cancer, or major surgery were noted for first- or second-degree relatives of the four groups of children. Only two significant findings were identified. Significantly more mothers of children who attempted suicide (rate = 0.333), of children who contemplated suicide (rate = 0.40), and of normal children (rate = 0.34) had histories

TABLE 3
Lifetime Morbidity Risk for Psychiatric Disorders in First-Degree Biological Relatives of Proband Groups

Disorder	Suicide Attempter (*N* = 25)				Suicidal Ideator (*N* = 28)				Clinical Control (*N* = 16)				Normal Control (*N* = 54)							
	N[a]	Mean Pedigree Size[b]	Rate per Family	BZ[c]	*N*[a]	Mean Pedigree Size[b]	Rate per Family	BZ[c]	*N*[a]	Mean Pedigree Size[b]	Rate per Family	BZ[c]	*N*[a]	Mean Pedigree Size[b]	Rate per Family	BZ[c]	χ^2 or *F*	*df*	*p*	Significant Paired Groups[d]
Suicide																				
First degree	22	2.50	0.000	(0.00)	27	3.00	0.000	(0.00)	14	3.14	0.000	(0.00)	54	2.72	0.000	(0.00)	—	3	—	N/A
Mother	22	—	0.000	—	27	—	0.000	—	14	—	0.000	—	54	—	0.000	—	—	3	—	N/A
Father	21	—	0.000	—	26	—	0.000	—	13	—	0.000	—	53	—	0.000	—	—	3	—	N/A
Sibs >18 yr	8	1.50	0.000	—	15	1.87	0.000	—	9	1.89	0.000	—	24	1.67	0.000	—	—	3	—	N/A
Suicide attempts																				
First degree	22	2.50	0.303	(0.25)	24	3.00	0.150	(0.15)	14	3.14	0.036	(0.03)	54	2.72	0.071	(0.08)	6.819	3	.00	1,4
Mother	21	—	0.476	—	23	—	0.261	—	13	—	0.077	—	49	—	0.143	—	10.691	3	.01	1
Father	19	—	0.053	—	20	—	0.000	—	12	—	0.000	—	48	—	0.021	—	2.010	3	.57	NS
Sibs >18 yr	7	1.50	0.286	—	9	1.87	0.222	—	8	1.89	0.000	—	19	1.67	0.100	—	1.206	3	.32	NS
Assaultive behaviors																				
First degree	22	2.23	0.496	(0.51)	26	2.54	0.413	(0.44)	13	2.69	0.436	(0.60)	54	2.41	0.193	(0.31)	4.453	3	.005	1,2
Mother	19	—	0.421	—	24	—	0.375	—	11	—	0.273	—	50	—	0.160	—	6.681	3	.08	NS
Father	19	—	0.500	—	24	—	0.458	—	12	—	0.583	—	49	—	0.225	—	13.766	4	.008	1,2,3
Sibs >18 yr	7	1.42	0.214	—	9	2.00	0.167	—	8	1.50	0.250	—	20	1.55	0.200	—	0.061	3	.979	NS
Mood disorders																				
First degree	23	2.35	0.373	(0.54)	27	2.63	0.438	(0.59)	14	2.36	0.274	(0.31)	53	2.34	0.308	(0.40)	0.723	3	.54	NS
Mother	22	—	0.591	—	26	—	0.615	—	13	—	0.461	—	46	—	0.435	—	2.906	3	.41	NS
Father	21	—	0.143	—	25	—	0.320	—	12	—	0.000	—	46	—	0.217	—	7.858	3	.05	NS
Sibs >18 yr	7	1.57	0.429	—	12	1.67	0.300	—	7	1.14	0.143	—	21	1.52	0.143	—	1.426	3	.25	NS
Anxiety																				
First degree	23	2.35	0.069	(0.08)	27	2.63	0.086	(0.12)	14	2.36	0.071	(0.04)	53	2.34	0.071	(0.05)	0.049	3	.98	NS
Mother	22	—	0.091	—	26	—	0.077	—	13	—	0.154	—	46	—	0.087	—	0.591	3	.89	NS
Father	21	—	0.095	—	25	—	0.120	—	12	—	0.000	—	46	—	0.044	—	3.288	3	.35	NS
Sibs >18 yr	7	1.57	0.000	—	12	1.67	0.000	—	7	1.14	0.000	—	21	1.52	0.000	—	—	3	—	N/A
Psychosis																				
First degree	23	2.35	0.014	(0.03)	27	2.63	0.019	(0.02)	14	2.36	0.000	(0.00)	53	2.34	0.010	(0.01)	0.271	3	.00	NS
Mother	22	—	0.046	—	26	—	0.039	—	13	—	0.000	—	46	—	0.000	—	3.268	3	.85	NS
Father	21	—	0.000	—	25	—	0.000	—	12	—	0.000	—	46	—	0.022	—	1.644	3	.35	NS
Sibs >18 yr	7	1.57	0.000	—	12	1.67	0.000	—	7	1.14	0.000	—	21	1.52	0.000	—	—	3	.65	N/A
Axis II (without antisocial)																				
First degree	23	2.35	0.058	(0.07)	27	2.63	0.031	(0.02)	14	2.36	0.000	(0.00)	53	2.34	0.024	(0.02)	0.816	3	.49	NS
Mother	22	—	0.091	—	26	—	0.039	—	13	—	0.000	—	46	—	0.000	—	5.479	3	.14	NS
Father	21	—	0.048	—	25	—	0.040	—	12	—	0.000	—	46	—	0.065	—	1.487	3	.69	NS
Sibs >18 yr	7	1.57	0.000	—	12	1.67	0.000	—	7	1.14	0.000	—	21	1.52	0.000	—	—	3	—	N/A
Antisocial personality																				
First degree	23	2.35	0.170	(0.19)	27	2.63	0.127	(0.14)	14	2.36	0.000	(0.00)	53	2.34	0.032	(0.03)	4.116	3	.008	1,3,4,5
Mother	22	—	0.046	—	26	—	0.039	—	13	—	0.000	—	46	—	0.000	—	3.268	3	.35	NS
Father	21	—	0.286	—	25	—	0.200	—	12	—	0.000	—	46	—	0.087	—	14.921	3	.005	1
Sibs >18 yr	7	1.57	0.091	—	12	1.67	0.000	—	7	1.14	0.000	—	21	1.52	0.000	—	1.474	3	.23	NS
Substance abuse																				
First degree	23	2.35	0.188	(0.22)	27	2.63	0.290	(0.25)	14	2.36	0.071	(0.08)	53	2.34	0.060	(0.09)	5.429	3	.001	1,2,5
Mother	22	—	0.091	—	26	—	0.231	—	13	—	0.077	—	46	—	0.044	—	5.878	3	.12	NS
Father	21	—	0.238	—	25	—	0.320	—	12	—	0.083	—	46	—	0.109	—	5.986	3	.11	NS
Sibs >18 yr	7	1.57	0.214	—	12	1.67	0.310	—	7	1.14	0.000	—	21	1.52	0.062	—	2.351	3	.08	NS
Alcohol abuse																				
First degree	23	2.35	0.264	(0.34)	27	2.63	0.247	(0.35)	14	2.36	0.083	(0.16)	53	2.34	0.129	(0.19)	1.941	3	.13	NS
Mother	22	—	0.182	—	26	—	0.231	—	13	—	0.154	—	46	—	0.087	—	2.991	3	.39	NS
Father	21	—	0.429	—	25	—	0.320	—	12	—	0.083	—	46	—	0.196	—	6.725	3	.08	NS
Sibs >18 yr	7	1.57	0.071	—	12	1.67	0.125	—	7	1.14	0.000	—	21	1.52	0.094	—	0.521	3	0.67	NS
Hospitalization[e]																				
First degree	22	2.27	0.300	—	24	2.63	0.251	—	14	2.43	0.100	(0.31)	51	2.31	0.081	—	4.183	3	.008	1,2
Mother	20	—	0.350	—	23	—	0.304	—	11	—	0.091	—	45	—	0.044	—	13.572	3	.004	1,2,4
Father	19	—	0.158	—	20	—	0.150	—	11	—	0.091	—	43	—	0.116	—	0.428	3	.94	NS
Sibs >18 yr	7	1.57	0.285	—	11	1.82	0.178	—	8	1.50	0.000	—	20	1.50	0.083	—	1.480	3	.24	NS
Family discord[f]																				
First degree	23	1.87	0.613	—	27	1.93	0.411	—	14	1.79	0.464	—	53	1.76	0.281	—	2.861	3	.04	1,2,3

[a]Number of families who have at least one relative under investigation.
[b]Mean number of relatives per family under investigation.
[c]BZ = Bezugsziffer.
[d]Significant paired contrasts are as follows: 1 indicates suicide attempter vs. normal control; 2, suicidal ideator vs. normal control; 3, clinical control vs. normal control; 4, suicide attempter vs. clinical control; 5, suicidal ideator vs. clinical control; and 6, suicide attempter vs. suicide ideator. N/A = not applicable; NS = not significant.
[e]Hospitalization in mental health institution.
[f]Family discord that ended in divorce. Exclusion of sibs older than 18 years.

TABLE 4
Lifetime Morbidity Risk for Psychiatric Disorders in Second-Degree Biological Relatives of Proband Groups

	Suicide Attempter (N = 25)				Suicidal Ideator (N = 28)				Clinical Control (N = 16)				Normal Control (N = 54)							
Disorder	N^a	Mean Pedigree Size[b]	Rate per Family	BZ[c]	N^a	Mean Pedigree Size[b]	Rate per Family	BZ[c]	N^a	Mean Pedigree Size[b]	Rate per Family	BZ[c]	N^a	Mean Pedigree Size[b]	Rate per Family	BZ[c]	χ^2 or F	df	p	Significant Paired Groups[d]
Suicide																				
Second degree	23	7.04	0.012	(0.00)	26	7.23	0.005	(0.00)	14	7.21	0.030	(0.00)	53	9.53	0.012	(0.00)	1.239	3	.30	NS
Grandparents	19	2.91	0.016	—	24	3.23	0.000	—	9	3.29	0.022	—	46	3.76	0.005	—	0.743	3	.53	NS
Uncles & aunts	18	5.16	0.010	—	22	4.16	0.010	—	10	4.23	0.036	—	40	6.00	0.016	—	0.902	3	.44	NS
Suicidal attempts																				
Second degree	20	7.04	0.027	(0.02)	24	7.23	0.037	(0.04)	10	7.21	0.034	(0.03)	47	9.53	0.069	(0.05)	0.912	3	.44	NS
Grandparents	19	2.91	0.000	—	24	3.23	0.021	—	9	3.29	0.000	—	46	2.76	0.054	—	1.618	3	.19	NS
Uncles & aunts	18	5.16	0.060	—	22	4.16	0.083	—	10	4.23	0.050	—	40	6.00	0.036	—	0.206	3	.89	NS
Assaultive behaviors																				
Second degree	21	6.24	0.180	(0.12)	25	5.24	0.148	(0.15)	11	4.73	0.250	(0.04)	48	7.73	0.143	(0.14)	0.125	3	.95	NS
Grandparents	19	2.63	0.110	—	25	2.60	0.160	—	10	2.60	0.300	—	46	3.29	0.163	—	0.583	3	.63	NS
Uncles & aunts	19	4.26	0.187	—	22	3.00	0.109	—	10	2.60	0.100	—	40	5.50	0.100	—	1.237	3	.30	NS
Mood disorders																				
Second degree	21	6.81	0.168	(0.17)	25	5.20	0.152	(0.20)	12	4.75	0.126	(0.21)	48	7.69	0.127	(0.15)	0.228	3	.88	NS
Grandparents	20	2.95	0.179	—	21	2.81	0.143	—	11	2.82	0.129	—	44	3.39	0.091	—	0.819	3	.49	NS
Uncles & aunts	18	4.67	0.188	—	23	3.09	0.240	—	11	2.36	0.195	—	41	5.37	0.173	—	0.033	3	.99	NS
Anxiety																				
Second degree	21	6.81	0.023	(0.02)	25	5.20	0.057	(0.05)	12	4.75	0.028	(0.03)	48	7.69	0.039	(0.03)	0.237	3	.87	NS
Grandparents	20	2.95	0.000	—	21	2.81	0.048	—	11	2.82	0.053	—	44	3.39	0.036	—	0.898	3	.45	NS
Uncles & aunts	18	4.67	0.044	—	23	3.09	0.047	—	11	2.36	0.000	—	41	5.37	0.043	—	0.821	3	.49	NS
Psychosis																				
Second degree	21	6.81	0.083	(0.04)	25	5.20	0.017	(0.04)	12	4.75	0.021	(0.00)	48	7.69	0.024	(0.01)	1.640	3	.18	NS
Grandparents	20	2.95	0.075	—	21	2.81	0.017	—	11	2.82	0.045	—	44	3.39	0.019	—	0.649	3	.59	NS
Uncles & aunts	18	4.67	0.048	—	23	3.09	0.017	—	11	2.36	0.000	—	41	5.37	0.013	—	1.675	3	.18	NS
Axis II (without antisocial)																				
Second degree	21	6.81	0.016	(0.02)	25	5.20	0.016	(0.01)	12	4.75	0.000	(0.00)	48	7.69	0.002	(0.02)	0.471	3	.07	NS
Grandparents	20	2.95	0.013	—	21	2.81	0.000	—	11	2.82	0.000	—	44	3.39	0.020	—	0.72	3	.54	NS
Uncles & aunts	18	4.67	0.005	—	23	3.09	0.032	—	11	2.36	0.000	—	41	5.37	0.023	—	0.678	3	.57	NS
Antisocial personality																				
Second degree	21	6.81	0.084	(0.01)	25	5.20	0.055	(0.01)	12	4.75	0.000	(0.00)	48	7.69	0.052	(0.04)	0.142	3	.34	NS
Grandparents	20	2.95	0.054	—	25	2.81	0.040	—	11	2.82	0.000	—	44	3.39	0.060	—	0.649	3	.59	NS
Uncles & aunts	18	4.67	0.091	—	23	3.09	0.059	—	11	2.36	0.000	—	41	5.37	0.049	—	0.906	3	.44	NS
Alcohol abuse																				
Second degree	21	6.81	0.206	(0.15)	25	5.20	0.213	(0.09)	12	4.75	0.384	(0.21)	48	7.69	0.164	(0.15)	1.835	3	.15	NS
Grandparents	20	2.95	0.238	—	21	2.81	0.190	—	11	2.82	0.508	—	44	3.39	0.189	—	2.622	3	.05	3
Uncles & aunts	18	4.67	0.161	—	23	3.09	0.151	—	11	2.36	0.195	—	41	5.37	0.128	—	0.180	3	.91	NS
Substance abuse																				
Second degree	21	6.81	0.073	(0.04)	25	5.20	0.079	(0.08)	12	4.75	0.125	(0.05)	48	7.69	0.036	(0.06)	0.574	3	.63	NS
Grandparents	20	2.95	0.000	—	21	2.81	0.012	—	11	2.82	0.045	—	44	3.39	0.017	—	0.558	3	.64	NS
Uncles & aunts	18	4.67	0.114	—	23	3.09	0.116	—	11	2.36	0.273	—	41	5.37	0.063	—	1.197	3	.32	NS
Hospitalization[e]																				
Second degree	20	6.55	0.127	—	24	5.50	0.134	—	10	5.70	0.131	—	46	7.65	0.127	—	0.098	3	.96	NS
Grandparents	19	2.63	0.123	—	24	2.63	0.083	—	10	2.70	0.158	—	42	3.33	0.087	—	0.542	3	.65	NS
Uncles & aunts	18	4.50	0.124	—	22	3.14	0.210	—	10	3.00	0.079	—	41	5.17	0.129	—	0.609	3	.61	NS

[a]Number of families who have at least one relative under investigation.
[b]Mean number of relatives per family under investigation.
[c]BZ = Bezugsziffer.
[d]Significant paired contrasts are as follows: 1 indicates suicide attempter vs. normal control; 2, suicidal ideator vs. normal control; 3, clinical control vs. normal control; 4, suicide attempter vs. clinical control; 5, suicidal ideator vs. clinical control; and 6, suicide attempter vs. suicide ideator. NS = not significant.
[e]Hospitalization in mental health institution.

of major surgical procedures than mothers of nonsuicidal child psychiatric inpatients (rate = 0.00) (F[3,123] = 10.81, $p < .01$). In addition, rates of cancer reported by grandparents of nonsuicidal psychiatric inpatients (rate = 0.41) were higher than those of grandparents of children who attempted suicide (rate = 0.13) or who reported suicidal ideation (rate = 0.16), but comparable to those of grandparents of normal children (rate = 0.23) (F[3,123] = 2.83, $p < .04$). The nature of the association of these findings for physical illness with specific groups of children is not clear.

DISCUSSION

This study is among the few systematic investigations of family psychopathology of children and adolescents at risk for suicidal behavior. It is unique in identifying psychopathological symptoms and disorders among

comprehensively studied first- and second-degree relatives of prepubertal psychiatric inpatients who report suicidal ideation and suicide attempts. No first-degree relatives in this study committed suicide.

Child psychiatric inpatients who reported a suicide attempt, compared to nonsuicidal child psychiatric inpatients and normal children, had significantly higher rates of first-degree relatives, notably mothers, who reported suicide attempts. It is noteworthy that 50% of the mothers of suicide attempter children reported a history of a suicide attempt. Comparable rates of first-degree relatives of children who reported suicidal ideation and of first-degree relatives of children who reported suicide attempts had a history of a suicide attempt. Similar to the results of the present study, Puig-Antich and collaborators (1989) reported that the differences in morbidity risks for suicide attempts among first-degree relatives of depressed children were accounted for by the elevated rates of suicide attempts among the mothers. The results on suicide attempts of relatives in the present study concur with reports of adults (Egeland and Sussex, 1985; Murphy and Wetzel, 1982; Pitts and Winokur, 1964; Tsuang, 1983) and of youth (Brent et al., 1988, 1990; Garfinkel et al., 1982; Kerfoot, 1988; Myers et al., 1985; Pfeffer et al., 1982; Shaffer, 1988; Tishler and McKenry, 1982), suggesting that suicidal acts run in families.

The results of the present study are reemphasized by the lifetime morbidity risks for suicide attempts as calculated by BZ. Among first-degree relatives of prepubertal suicide attempters, BZ was 0.25. It was 0.15 for first-degree relatives of children who contemplated suicide. These BZs were significantly higher than those of first-degree relatives of nonsuicidal patients (BZ = 0.02) or normal children (BZ = 0.08). No other available study reported lifetime morbidity risk (BZ) for suicidal acts of relatives of suicidal youth. However, Puig-Antich and colleagues (1989) reported that the lifetime morbidity risk (BZ) for suicidal acts of first-degree relatives of prepubertal depressed children, which was 0.05, was significantly lower than that of 0.21 for first-degree relatives of children with nonaffective psychopathology.

In our study, significantly more first-degree relatives of suicide attempters had antisocial personality disorder than first-degree relatives of nonsuicidal patients and normal children. More first-degree relatives of suicide attempter children and children who reported suicidal ideation, compared to first-degree relatives of normal children, had histories of assaultive behavior and substance abuse. More first-degree relatives of children who contemplated suicide had antisocial and substance abuse disorders than first-degree relatives of nonsuicidal patients. These psychiatric problems among first-degree relatives were especially prevalent among the fathers of suicidal children.

The results of this study did not support the hypothesis that mood disorders in relatives would be associated with prepubertal suicidal acts. A lack of association between suicidal behavior in child probands and major depressive disorder in relatives was suggested also in the study reported by Puig-Antich and colleagues (1989), who noted that higher rates of alcoholism and antisocial personality disorder were found in parents of suicidal children who did not have an affective disorder.

No significant differences in psychiatric symptoms and disorders were identified for second-degree relatives of suicidal and nonsuicidal children. These results may be related to the fact that second-degree relatives were not directly interviewed and to the diminished sensitivity of identifying psychopathology using the Family History Method. It may be related to differences in rates of psychopathology in relatives from different generations as noted by reports (Klerman, 1988) suggesting higher rates of depression, suicidal behavior, and other psychopathologies in cohorts born more recently. It is noteworthy also that siblings of suicidal and nonsuicidal children did not differ in their rates of psychopathologies. This, too, may be a function of informant bias. It may be related also to the fact that siblings have not passed through the period of high risk for suicidal behavior and other psychopathologies. Further research is needed to explore these issues.

Strengths and Limitations of This Study

This study provides comprehensive data on a large sample of relatives of suicidal and nonsuicidal children. By using prepubertal children as probands, information about multiple generations of relatives could be ascertained. We used direct interview methods for the parents that involved the Schedule for Affective Disorders and Schizophrenia, a reliable standard research instrument to assess lifetime psychopathology of the parents (Endicott and Spitzer, 1978). Assessments of parents were conducted by interviewers who were blind to the clinical status of the child probands. Parents

reported on psychiatric and medical problems of the probands' siblings, aunts, uncles, and grandparents. However, a limitation of this study is that the Family History Method (Andreasen et al., 1977) used in this study tends to identify lower rates of pathology than direct interview methods. An advantage of interviewing relatives at the 6- to 8-year follow-up assessment was that as relatives passed through more of the risk periods for various psychopathologies, the likelihood of identifying lifetime psychiatric symptoms and disorders was increased. Nevertheless, it is noteworthy that 75% of the mothers attempted suicide early in the child's life such as before the child's 12th birthday. Because suicide is a relatively rare event, the present study could not discern statistically significant relations between relatives who committed suicide and suicidal states in the children. Research with children whose parents committed suicide is needed to enhance knowledge about familial aggregation of suicidal behavior in child probands.

Clinical and Research Implications

The findings of this study suggest the necessity of evaluating familial psychiatric status during assessments of prepubertal children who report suicidal ideation or suicide attempts. Disturbances in the family environment that may be related to psychopathology among relatives are important factors on which to focus treatment. Psychosocial interventions should aim to diminish family discord and to modify symptoms of suicidal behavior, violence, substance abuse, and antisocial personality disorders among relatives who have contact with a suicidal child. Psychopharmacological treatments should be offered to ameliorate psychiatric symptoms and disorders of relatives as a method of stabilizing the family milieu in which suicidal children grow up. Controlled treatment trials using interventions directed at psychopathologies of relatives are needed to identify the efficacy of family interventions to reduce risk for youth suicidal behavior. The most important findings of this study—that self-directed and externally directed violence, antisocial personality disorder, and substance abuse disorders of relatives were positively associated with suicidal states of prepubertal children—parallel research results with adults (Siever and Davis, 1991), suggesting that suicidal behavior is associated with impulsivity, violence, and personality disorders. In addition, recent important research (Brent et al., 1993) with suicidal adolescents highlights the significant association between suicidal acts and personality disorders. Further research with prepubertal children is needed to identify whether pathological personality traits can be identified in suicidal children. Alterations in serotonin neurotransmitter functions have been identified in suicidal adults, especially those prone to impulsivity, violence, and personality disorders (Brown et al., 1982; Coccaro and Siever, 1989; Mann and Arango, 1992). Research is necessary to determine whether such disturbances in serotonin functions occur in relatives of suicidal children. The results of such research may open up new vistas for suicide prevention strategies that may focus on etiological mechanisms for suicidal behavior among youth.

REFERENCES

Alcohol, Drug Abuse, and Mental Health Administration (1989), *Report of the Secretary's Task Force on Youth Suicide.* (DHHS Publication ADM 89–1624). Washington, DC: US Department of Health and Human Services

Andreasen NC, Endicott J, Spitzer RL, Winokur G (1977), The family history method using diagnostic criteria: reliability and validity. *Arch Gen Psychiatry* 34:1229–1235

Brent DA, Johnson B, Bartle S et al. (1993), Personality disorder, tendency to impulsive violence, and suicidal behavior in adolescents. *J Am Acad Child Adolesc Psychiatry* 32:69–75

Brent DA, Kolko DJ, Allan MJ, Brown RV (1990), Suicidality in affectively disordered adolescent inpatients. *J Am Acad Child Adolesc Psychiatry* 29:586–593

Brent DA, Perper JA, Goldstein CE et al. (1988), Risk factors for adolescent suicide: a comparison of adolescent suicide victims with suicidal inpatients. *Arch Gen Psychiatry* 45:581–588

Bronisch T, Hecht H (1987), Comparison of depressed patients with and without suicide attempts in their past history. *Acta Psychiatr Scand* 76:438–449

Brown GL, Ebert MH, Goyer PF et al. (1982), Aggression, suicide, and serotonin: relationships to CSF amine metabolites. *Am J Psychiatry* 139:741–746

Burke KC, Burke JD Jr, Regier DA, Rie DS (1990), Age at onset of selected mental disorders in five community populations. *Arch Gen Psychiatry* 47:511–518

Coccaro E, Siever L (1989), Serotonergic studies in patients with affective and personality disorders. *Arch Gen Psychiatry* 46:587–599

Cohen J (1960), A coefficient of agreement for nominal scales. *Educational Psychological Measures* 20:37–46

Deykin EY, Alpert JJ, McNamarra JJ (1985), A pilot study of the effect of exposure to child abuse or neglect or adolescent suicidal behavior. *Am J Psychiatry* 142:1299–1303

Egeland JA, Sussex JN (1985), Suicide and family loading for affective disorders. *JAMA* 254:915–918

Endicott J, Spitzer RL (1978), A diagnostic interview: the Schedule for Affective Disorders and Schizophrenia. *Arch Gen Psychiatry* 35:837–844

Friedman RC, Corn R, Hurt SW, Fibel B, Schulick J, Swirsky S (1984), Family history of illness in the seriously suicidal adolescent: a life-cycle approach. *Am J Orthopsychiatry* 54:390–397

Garfinkel BD, Froese A, Hood J (1982), Suicide attempts in children and adolescents. *Am J Psychiatry* 139:1257–1261

Green AH (1978), Self-destructive behavior in battered children. *Am J Psychiatry* 135:579–582

Haberlandt W (1967), Aportacion a la genetica del suicidio. *Folio Clinica Internacional* 17:319–322

Hollingshead AB, Redlich P (1958), *Social Class and Mental Illness.* New York: Wiley

Joffe RT, Offord DR, Boyle MH (1988), Ontario Child Health Study: suicidal behavior in youth age 12–16 years. *Am J Psychiatry* 145: 1420–1423

Juel-Nielson N, Videbeck T (1970), A twin study of suicide. *Acta Genet Med Gemellol (Roma)* 19:307–310

Kallman F, DePorte J, Deporte E, Feingold L (1949), Suicide in twins and only children. *Am J Hum Genet* 2:113–126

Kerfoot M (1988), Deliberate self-poisoning in childhood and early adolescence. *J Child Psychol Psychiatry* 29:335–343

Klerman GL (1988), The current age of youthful melancholia. *Br J Psychiatry* 152:154

Kosky R (1983), Childhood suicidal behavior. *J Child Psychol Psychiatry* 24:457–468

Linkowski P, deMaertelaer V, Mendlewicz J (1985), Suicidal behavior in major depressive illness. *Acta Psychiatr Scand* 72:233–238

Mann JJ, Arango V (1992), Integration of neurobiology and psychopathology in a unified model of suicidal behavior. *J Clin Psychopharmacol* 12:25–75

Mitterauer B, Leibetseder M, Pritz WF, Sorgo G (1988), Comparisons of psychopathological phenomena of 422 manic-depressive patients with suicide-positive and suicide-negative family history. *Acta Psychiatr Scand* 77:438–442

Murphy GE, Wetzel RD (1982), Family history of suicidal behavior among suicide attempters. *J Nerv Ment Dis* 170:86–90

Myers KM, Burke P, McCauley E (1985), Suicidal behavior by hospitalized preadolescent children on a psychiatric unit. *J Am Acad Child Psychiatry* 24:474–480

National Center for Health Statistics (1993), Advance report of final mortality statistics, 1990. *Monthly Vital Statistics Report.* Vol 41, no. 7, suppl. Hyattsville, MD: US Public Health Service

Orvaschel H, Walsh-Allis G, Ye W (1988), Psychopathology in children of parents with recurrent depression. *J Abnorm Child Psychol* 16:17–28

Pfeffer CR, Conte HR, Plutchik R, Jerrett I (1979), Suicidal behavior in latency-age children: an empirical study. *J Am Acad Child Psychiatry* 18:679–692

Pfeffer CR, Conte HR, Plutchik R, Jerrett I (1980), Suicidal behavior in latency-age children: an empirical study. *J Am Acad Child Psychiatry* 19:703–710

Pfeffer CR, Klerman GL, Hurt SW, Kakuma T, Peskin JR, Siefker CA (1993), Suicidal children grow up: rates and psychosocial risk factors for suicide attempts during follow-up. *J Am Acad Child Adolesc Psychiatry* 32:106–113

Pfeffer CR, Klerman GL, Hurt SW, Lesser M, Peskin JR, Siefker CA (1991), Suicidal children grow up: demographic and clinical risk factors for adolescent suicide attempts. *J Am Acad Child Adolesc Psychiatry* 30:609–616

Pfeffer CR, Newcorn J, Kaplan G, Plutchik R, Mizruchi MS (1988), Suicidal behavior in adolescent psychiatric inpatients. *J Am Acad Child Adolesc Psychiatry* 27:357–361

Pfeffer CR, Peskin JR, Siefker CA (1992), Suicidal children grow up: psychiatric treatment during follow-up period. *J Am Acad Child Adolesc Psychiatry* 31:679–685

Pfeffer CR, Plutchik R, Mizruchi MS (1983), Suicidal and assaultive behavior in children: classification, measurement, and interrelations. *Am J Psychiatry* 140:154–157

Pfeffer CR, Plutchik R, Mizruchi MS, Lipkins R (1986), Suicidal behavior in child psychiatric inpatients and outpatients and in nonpatients. *Am J Psychiatry* 143:733–738

Pfeffer CR, Solomon G, Plutchik R, Mizruchi MS, Weiner A (1982), Suicidal behavior in latency-age psychiatric inpatients: a replication and cross validation. *J Am Acad Child Psychiatry* 21:564–569

Pitts F, Winokur G (1964), Affective disorder III: diagnostic correlates and incidence of suicide. *J Nerv Ment Dis* 139:176–181

Puig-Antich J, Goetz D, Davies M et al. (1989), A controlled family history study of prepubertal major depressive disorder. *Arch Gen Psychiatry* 46:406–418

Rosenthal PA, Rosenthal S (1984), Suicidal behavior by preschool children. *Am J Psychiatry* 141:520–525

Roy A (1982), Risk factors for suicide in psychiatric patients. *Arch Gen Psychiatry* 39:1089–1095

Roy A (1983), Family history of suicide. *Arch Gen Psychiatry* 40:971–974

Scheftner WA, Young MA, Endicott J et al. (1988), Family history and five-year suicide risk. *Br J Psychiatry* 153:805–809

Schulsinger F, Kety SS, Rosenthal D, Wender PH (1979), A family study of suicide. In: *Origin, Prevention and Treatment of Affective Disorders,* Shou M, Stromgren E, eds. Orlando, FL: Academic Press Inc

Shaffer D (1988), The epidemiology of teen suicide: an examination of risk factors. *J Clin Psychiatry* 49:36–41

Shafii M, Carrigan S, Whittinghill JR, Derrick A (1985), Psychological autopsy of completed suicide in children and adolescents. *Am J Psychiatry* 142:1061–1064

Siever LJ, Davis KL (1991), A psychobiological perspective on the personality disorders. *Am J Psychiatry* 148:1647–1658

Slater E, Cowie V (1971), *The Genetics of Mental Disorders.* London: Oxford University Press

Tishler CL, McKenry PC (1982), Parental negative self and adolescent suicide attempts. *J Am Acad Child Psychiatry* 21:404–408

Tsuang MT (1983), Risk of suicide in relatives of schizophrenics, manics, depressives, and controls. *J Clin Psychiatry* 44:396–400

Weissman MM, Fendrich M, Warner V, Wickramaratne P (1992), Incidence of psychiatric disorder in offspring at high and low risk for depression. *J Am Acad Child Adolesc Psychiatry* 31:640–648

Weissman MM, Prusoff BA, Gammon GD, Merikangas KR, Leckman JF, Kidd KK (1984), Psychopathology in the children (ages 6–18) of depressed and normal parents. *J Am Acad Child Psychiatry* 23:78–84

Wender PH, Kety SS, Rosenthal D, Schulsinger F, Ortmann J, Lunde I (1986), Psychiatric disorders in the biological and adoptive families of adopted individuals with affective disorders. *Arch Gen Psychiatry* 43:923–929

Zair K (1981), A suicidal family. *Br J Psychiatry* 189:68–69