

Suicidal Attempts among Older Adolescents: Prevalence and Co-occurrence with Psychiatric Disorders

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Abstract. The prevalence of suicidal attempts and ideation and the co-occurrence of attempts with psychiatric disorders were examined in a community sample of 1710 older adolescents. Structured interviews using rigorous diagnostic criteria were conducted in two annual assessments. Lifetime prevalence of attempts was 7.1% and ideation was 21.1%. Almost 90% of those who attempted also evidenced suicidal ideation. Suicide attempts occurred in conjunction with depressive, substance use, and disruptive behavior disorders but not with panic disorders. Results indicate that risk factors for an attempt are the following: being female, from a home without a father, poor education of the father, previous attempts, suicidal ideation, and mental disorders. *J. Am. Acad. Child Adolesc. Psychiatry*, 1992, 31, 4:655-662. **Key Words:** adolescent suicide, suicidal ideation, psychiatric disorder, epidemiology.

Suicidal behavior is a significant mental health problem among adolescents, and it recently has received much attention in the literature (e.g., a special issue of *Suicide and Life-Threatening Behavior*, 1989, Vol. 19, No. 1, was dedicated to this topic). The rate of suicide among youths has increased dramatically over the past 30 years, from 2 in 100,000 in 1960 to 12 in 100,000 at present, with major increases occurring among those 15 to 19 years old (Maris, 1985; National Center for Health Statistics, 1988; Rosenberg et al., 1987). According to Gammon et al. (1986), since 1956 there has been a 3- to 6-fold increase in adolescent suicide rates.

There are a number of problems inherent in studying suicide completions. First, the actual number of completed suicides fortunately has been quite small, limiting the use of prospective studies. Second, because suicide completers can no longer be examined, investigators have been limited to retrospective information obtained from people who knew the deceased or from data that were collected on the deceased for various reasons. The primary method used to obtain this information is the psychological autopsy (Beckow et al., 1990; Brent, 1987). These are extremely difficult to do, and most do not meet the stringent criteria given by Younger et al. (1990).

An alternative to studying completers is to study individuals who make an unsuccessful attempt to commit suicide. With relatively few exceptions (e.g., Garrison et al., 1991; Unpublished manuscript; Harkavy Friedman et al., 1987; Joffe et al., 1988; Velez and Cohen, 1988), the majority of studies of suicide attempts among adolescents have been

based on clinical populations or those who have been treated in emergency rooms (e.g., Brent, 1987; Brent et al., 1990; Cairns et al., 1988; Deykin et al., 1985; Kosky et al., 1990; Kotila and Lonnquist, 1988). It is unclear to what extent the findings from these clinical studies generalize to community samples.

The first goal of this study was to provide information on the prevalence of suicide attempts and ideation based on a large community sample of older adolescents. The lifetime prevalence of attempts reported in community studies has ranged from 6% to 9% for self-report by high school students on anonymous surveys (Dubow et al., 1989; Harkavy Friedman et al., 1987; Shaffer et al., 1990; Smith and Crawford, 1986) to 3.5% in response to a structured interview among youth aged 9 to 18 (Lewis et al., 1988; Velez and Cohen, 1988). The lifetime prevalence of suicidal ideation has ranged from 26% (Lewis et al., 1988; Velez and Cohen, 1988) to approximately 50% (Harkavy Friedman et al., 1987; Smith and Crawford, 1986).

As part of the first goal, the methods, lethality, and intent of attempts will be reported, and the relation between attempts and demographic characteristics, particularly age and gender, will be examined. Most community studies have defined an attempt without regard to the intent of the adolescent or the lethality of the method. Exceptions include studies conducted by Garrison and her associates (Garrison et al., 1991) and Smith and Crawford (1986). Additionally, few community studies have examined gender and age effects, perhaps because of the small sample sizes of some of the studies. Researchers who have reported gender differences typically have found more females than males indicating that they have attempted suicide (Dubow et al., 1989; Joffe et al., 1988; Shaffer et al., 1990; Smith and Crawford, 1986) and have experienced suicidal ideation (Dubow et al., 1989; Joffe et al., 1988; Velez and Cohen, 1988). The one study that examined the effect of age on attempts (Dubow et al., 1989) did not find a significant effect. With regard to ideation, Dubow et al. (1989) reported an elevated rate among 9th graders, but Harkavy Friedman et al. (1987) did not find an age effect.

A second goal of this study was to examine the relation

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between suicidal ideation and attempts. Investigators have assumed that suicidal ideation places individuals at risk for suicide attempts (Beck et al., 1979; Bonner and Rich, 1987). Consistent with this assumption, clinical samples of adolescents experiencing more severe levels of suicidal ideation were more likely to attempt suicide than those adolescents experiencing lower levels of ideation (Bettes and Walker, 1986; Carlson and Cantwell, 1982). Similarly, in community samples, Dubow et al. (1989) have found that as level of ideation increased, students were more likely to make an attempt, and Harkavy Friedman et al. (1987) reported that all the attempters in their sample had some degree of ideation. We, therefore, hypothesized a relation between suicidal ideation and attempts and hypothesized that suicidal ideation would predict future attempts.

A third major goal of this study was to determine the association of attempts with *DSM-III-R* (American Psychiatric Association, 1987) psychiatric disorders in a community sample. It is reasonably well established that suicidal behavior is associated with *DSM-III-R* disorders. Psychological autopsies have indicated that most, if not all, adolescents who have completed suicide met *DSM-III* criteria for a diagnosis (Fowler et al., 1986; Shaffer, 1988; Shaffi et al., 1988). Studies with patient and outpatient populations have revealed an association between attempts and disorders, particularly depression (Brent et al., 1986; Carlson and Cantwell, 1982; Goldney and Pilowsky, 1980; Kosky et al., 1990; Robbins and Alessi, 1985; Stiffman et al., 1988), but also with substance abuse and conduct disorders (Berman and Schwartz, 1990; Cairns et al., 1988; Kosky et al., 1990; Marzuk and Mann, 1988; Schuckit and Schuckit, 1991; Shaffer, 1974; Stiffman et al., 1988). Although the co-occurrence of suicide attempts and psychiatric disorders has been clearly demonstrated, only a few of these studies have been based on adolescent community samples. Results from the latter have indicated a relation between suicide attempts and depression (Smith and Crawford, 1986; Velez and Cohen, 1988) and substance use (Kandel, 1988).

As indicated earlier, retrospective studies with clinical samples have indicated that individuals with a history of previous attempts, suicidal thoughts, or a psychiatric disorder are at elevated risk for future attempts (Brent, 1987; Brent et al., 1990; Shaffer, 1974; Shaffi et al., 1988). However, to our knowledge there has been no previous prospective study. The fourth goal of this study was to examine the relation between past attempts, ideation, and psychiatric disorders and future attempts within the context of a prospective design.

Method

Subjects

The data presented here are from a large study of the prevalence of mental disorders in older adolescents. The population of this study was the total enrollment (approximately 10,200) of nine high schools (grades 9 to 12) in five communities in west central Oregon. During each of 3 consecutive years (cohorts), 1987 through 1989, a random sample of students were contacted and asked to participate

in two annual assessments. The participation rate for the T_1 assessment was relatively high (61% across the three cohorts), resulting in a final T_1 sample of 1,710 students. Students in the sample were compared with those who chose not to participate and to the 1980 census data. This sample was considered to be representative of those attending high school. Details regarding the sampling strategy and selection procedure and the representativeness of the sample are given elsewhere (Lewinsohn et al., 1988). There were no differences across cohorts and, therefore, the data were combined for analytical purposes. The demographic characteristics of the T_1 sample are given in Lewinsohn et al., (1991). Briefly, the sample was 51.9% female and had a mean age of 16.6 ($SD = 1.2$ years). The sample was predominantly Caucasian (91.1%), and the majority (71.3%) lived in two-parent households. Approximately 40% (42.8%) of the fathers and 30% (30.1%) of the mothers completed 4 years of college.

A second assessment was scheduled at least 12 months ($\bar{X} = 13.76$; $SD = 2.32$) after the initial assessment. The attrition rate from the T_1 to the T_2 assessment was approximately 12%, resulting in a T_2 sample size of 1,505 adolescents. Bias in the T_2 sample because of attrition was evaluated by comparing those who did not participate at T_2 ($N = 202$) with the T_1 and T_2 panel subjects on critical T_1 variables. The T_2 participants were slightly higher on parental socioeconomic status, number in household, proportion of females, and the educational level of the parents. However, the two groups did not differ on measures of psychopathology, such as number of suicide attempts, number of episodes of current and past disorder, including clinical depression, self-report of depression, race, or grade.

Diagnostic Interview

Adolescents were interviewed at T_1 , using the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) (Chambers et al., 1985; Puig-Antich and Chambers, 1983) and at T_2 with the Longitudinal Interval Follow-up Evaluation (LIFE) (Shapiro and Keller, 1979). Parents were also interviewed in the 1st year of the project. However, because of the high decline rate (48%) of families, the procedure was changed to interview only the adolescent. Therefore, diagnoses reported in this article are based only on the report of the adolescent. With the assistance of Professor Puig-Antich, we developed an interview schedule that combined the epidemiological version (K-SADS-E) (Orvaschel and Puig-Antich, 1986) and the present episode version (K-SADS-P). The combined interview thus provided information on the presence of specific symptoms for a reliable diagnosis of both current and lifetime depression and other psychiatric disorders, using *DSM-III-R* criteria. The LIFE interview elicited detailed information about the longitudinal course of all *DSM-III-R* disorders present at T_1 by asking respondents to provide retrospective (at T_2) information about their mental status since T_1 .

A second (reliability) interviewer watched the videotape and made diagnoses from approximately 15% of the interviews. With the exception of anxiety disorders ($\kappa = 0.53$) and dysthymia ($\kappa = 0.58$), kappas for lifetime diagnoses were good (ranging from 0.85 to 0.89). Kappas for current

diagnoses were exceptional for all diagnoses (ranging from 0.82 to 0.92) except anxiety disorders (0.60). More detail regarding the diagnostic interviews is given in Lewinsohn et al. (1988).

Assessment of Suicidal Attempt and Ideation

Information obtained in the interviews was used to identify adolescents who had attempted suicide. As part of the K-SADS protocol at T₁, adolescents were asked, "Have you ever tried to kill yourself or done anything that could have killed you?" At T₂, as part of the LIFE, adolescents were asked, "Have you tried to kill yourself or done anything that could have killed you since the last interview?" Adolescents were considered attempters if they responded positively to either of these questions. If the adolescent indicated that he or she had attempted suicide, the interviewers obtained a description of the most serious attempt and rated the adolescent's suicidal intent and the lethality of the attempt. As part of the K-SADS, intent was rated on a six-point scale ranging from "obviously no intent, purely manipulative" to "careful planning and every expectation of death." An example of an attempt given a high intent rating was taking approximately 150 barbiturates with a clear intention to commit suicide. An example of an attempt given a low intent rating was having an argument with Mom and taking 14 aspirins, which, per the subject, was a "manipulative gesture."

Lethality was rated using the Lethality of Suicide Attempts Rating Scale (Smith et al., 1984). This is an 11-point linear interval scale ranging from 0, "death is an impossible result," to 10, "death is almost a certainty." This scale focuses on the objective indicators of the actual attempt and is, therefore, not dependent on the adolescent's willingness to accurately discuss his or her intent. Examples of attempts given high lethality ratings were hanging oneself from a tree (the tree limb broke) and jumping in front of a truck (the truck swerved and stopped). Examples of attempts with low lethality ratings were taking 10 aspirins or cutting one's wrists slightly. The reliability of this scale has been assessed in two studies (Smith et al., 1984; Smith, unpublished manuscript) and is excellent with intraclass correlations ranging from 0.94 to 0.98.

The K-SADS was also used to identify those adolescents who had experienced suicidal thoughts or ideation at any time during their life or at T₁, using the following four questions: "Did you feel so bad that you thought about death or dying?" "Did you wish you were dead?" "Did you think about hurting or killing yourself?" or, "Have you ever made a plan to kill yourself?" The LIFE probed for answers to these questions since entry or at T₂. Analysis of the responses to these four questions indicated that they represented a single dimension. Items were intercorrelated (average correlation = 0.60) with an internal consistency, measured by Cronbach's coefficient alpha, of 0.86. Adolescents were considered ideators if they answered positively to any of the four questions.

Results

General Considerations

The results from numerous statistical tests will be pre-

sented in the following sections. Although probability levels of less than 0.05 are noted, to adjust for experiment error, only effects with probability levels of less than 0.01 are considered significant and are discussed.

Prevalence of Suicide Attempts

Of the 1,710 adolescents assessed at T₁, 121 (7.1%) had attempted suicide sometime in their life. A significantly greater proportion of girls (10.1%) as compared with boys (3.8%) attempted suicide ($\chi^2 = 25.89$, $df = 1$; $N = 1710$; $p < 0.001$). The effects of age and the age by gender interaction (assessed using logistic regression) were not significant.

A greater proportion of adolescents from single parent families (11.4%) as compared with two-parent families (5.3%) attempted suicide before T₁ ($\chi^2 = 19.32$; $df = 1$; $N = 1710$; $p < 0.001$). Further investigation of this finding revealed that absence of the father is the critical variable. A significantly greater proportion of adolescents with no male head of household (11.4%) than adolescents with a male head of household (5.7%) attempted suicide ($\chi^2 = 15.9$; $df = 1$; $N = 1710$; $p < 0.001$). The relationship between absence of female head of household and suicide attempts was not significant. Attempting suicide was related to the education of the father, but not the mother. Adolescents who had fathers without a college degree were significantly more likely to attempt suicide before T₁ (8.6%) than were those adolescents who had fathers with a college degree (3.7%) ($\chi^2 = 13.28$; $df = 1$; $N = 1700$; $p < 0.001$). There was no relation between attempting suicide before T₁ and number of siblings, racial or ethnic status, and repetition of a grade in school.

Of the 121 adolescents who attempted suicide before T₁, 50 (41.3%) made more than one attempt. There was no relation between number of attempts (multiple versus single) and age, gender, or the interaction between age and gender.

Of the adolescents who attempted suicide before T₁, 53% ingested pills, 27% cut their wrists or other parts of their bodies, 6% attempted hanging, and 14% used other methods (e.g., suffocation, pointed loaded gun but did not fire). The majority of attempts were of low lethality and/or lacked intent. Thirteen (14%) of the attempts were given a lethality rating of 5.0 (a 50/50 chance of survival) or above, and two (2%) were given the highest rating of lethality (death is an almost certainty); 52 (43%) of the attempts were given a rating of 3 (definite attempt) or above on suicide intent, and six (5%) were given the highest rating on intent (extreme, careful planning, and every expectation of death). There were no age or gender effects nor an interaction for the lethality of the attempt or for suicidal intent. The correlation between lethality and intent at T₁ was high, 0.67, indicating that, for adolescents, intentional attempts were often also lethal.

Twenty-six (1.8%) of the 1505 adolescents who completed the T₂ assessment reported an attempt since entry into the study (T₁). Twenty-five (1.7% of the T₂ sample) of these attempts occurred in the 12 months before T₂. The relation with gender was not significant, 2.2% (18) of the girls reported attempting suicide since T₁, compared to only 1.1% (8) of the boys ($\chi^2 = 2.59$; $df = 1$; $N = 1505$; NS). There

was neither an age effect nor an age by gender interaction. Because of the small number of attempters, the relation between 1-year prevalence and other demographic variables was not examined.

Thirty-six percent of the attempts between T₁ and T₂ were by ingesting pills, 36% were by cutting wrists, and 28% were by other methods (e.g., asphyxiation, jumping off building). Five (9.2%) of the attempts during this period were considered lethal (lethality greater or equal to 5.0) and 15 (57.7%) were considered intentional (intent greater or equal to 3).

Suicidal Ideation

Of the 1,710 adolescents interviewed at T₁, 360 or 21.1% experienced suicidal ideation during their lifetime: 279 or 16.3% reported thoughts of death, 227 or 13.3% wished they were dead, 220 or 12.9% thought about killing themselves, and 142 or 8.3% had a plan. A significantly greater proportion of females (25.7%) as compared to males (16.0%) experienced suicidal ideation ($\chi^2 = 24.19$; df = 1; N = 1710; p < 0.001). The relation between age and ideation was also significant with those 17 (26.8%) and 18 (22.0%) experienced ideation significantly more often than those 15 (17.1%) and 16 (18.2%) ($\chi^2 = 14.79$; df = 1; N = 1710; p < 0.001). The age by gender interaction was not significant.

Sixty-nine adolescents (4.6%) experienced suicidal ideation between T₁ and T₂: 47 or 3.4% reported thoughts of death, 39 or 2.8% wished they were dead, 40 or 2.9% thought about killing themselves, and 18 or 1.3% had a plan. The relation with gender was significant as 6.2% of the females, compared to 1.3% of the males, had suicidal thoughts ($\chi^2 = 10.32$; df = 1; N = 1505; p < 0.01). There was neither an age effect nor an age by gender interaction.

Association between Suicidal Attempts and Ideation

The association between suicide attempts before T₁ and suicidal ideation during this period was significant for both genders. A high proportion, 87.8% of the females ($\chi^2 = 202.02$; df = 1; N = 891; p < 0.001) and 87.1% of the males ($\chi^2 = 121.2$; df = 1; N = 819; p < 0.001), who attempted suicide also reported suicidal ideation. These percentages can be compared to those who did not attempt suicide. Among these adolescents, 1.7% of the females and 0.6% of the males reported suicidal ideation. There was not a gender difference in the proportion of adolescent attempters who experienced suicidal thoughts.

A large proportion of both females (72.2%; $\chi^2 = 138.7$; df = 1; N = 810; p < 0.001) and males (71.4%; $\chi^2 = 109.2$; df = 1; N = 698; p < 0.001) who attempted suicide between T₁ and T₂ also reported suicidal ideation during this same period. Among those who did not attempt suicide during this period, 4.7% of the females and 2.0% of the males reported suicidal ideation.

Co-occurrence between Suicide Attempts and Mental Disorders

Approximately 80% (males: 87.1%; females: 77.8%) of those adolescents who attempted suicide before T₁ also met criteria for a *DSM-III-R* psychiatric disorder sometime during this period. Table 1 presents the percentage of attempters

and nonattempters before T₁ who met criteria for each disorder during this period, along with associated odds ratios. The association between attempts and mental disorders was examined separately for each gender and for each age. We did not find age effects, but we did find differences across genders. The data are therefore presented separately for males and females.

For both males and females, significantly more adolescents who attempted suicide before T₁ met the criteria for a diagnosis of major depression, alcohol and drug abuse dependence, and disruptive behavior disorder during this period than did adolescents who did not attempt suicide. Gender differences in the relative prevalence of each disorder among attempters were examined by testing the significance of the gender by diagnosis interaction using logistic regression (predicting attempts) for each disorder. The only significant interaction was the interaction between gender and major depression ($\chi^2 = 8.4$; df = 1; N = 1710; p < 0.01; POR = 3.75; CI = 2.7, 164.7). As seen in Table 1, the prevalence among nonattempters is higher for females (21.3%) than males (9.5%). Conversely, the prevalence among attempters is higher among males (64.5%) than females (55.6%).

The majority of adolescents (57.9%) who attempted suicide before T₁ were diagnosed as having an episode of major depression in their lifetime. Most suicide attempts occurred during the episode (85%) rather than before (12%) or after (3%) the episode. However, the relation between a diagnosis of an affective disorder and suicide attempts and/or thoughts is confounded because suicide attempts and thoughts are included as symptoms in determining if the criteria for a diagnosis of an affective disorder is met. Therefore, among those with a diagnosis of an affective disorder, attempters were compared with nonattempters on the number of depressive symptoms, not including symptoms related to suicide. Suicide attempters had a significantly greater number of symptoms of depression ($\bar{X} = 17.20$) than nonattempters ($\bar{X} = 13.81$; F (1,39) = 5.81; p < 0.05).

Table 2 presents the association of suicide attempts (assessed at T₂) since entry into the study (T₁) with a diagnosis of a disorder during this period. The association between dysthymia and attempts were not included in this table because there were few diagnoses of dysthymia since entry. As the table indicates, all the males and 94.4% of the females who attempted suicide between T₁ and T₂ met criteria for at least one diagnosis since entry. The results are similar to those found with attempts before T₁. For both genders, there was a significant association between an attempt and major depression and alcohol abuse dependence. For females, but not males, there was a significant association between suicide attempts and both drug abuse dependence and disruptive behavior disorder. Conversely, for males, but not females, there was a significant association between anxiety disorders and suicide attempts. Despite the apparent gender differences, an examination of the significance of the gender by diagnosis interaction using logistic regression revealed that there were no gender differences in the proportion of attempters diagnosed with any of the disorders.

TABLE 1. Percentage of Attempters versus Nonattempters before T_1 with a Diagnosis of Each DSM-III-R Mental Disorder Sometime during This Period

	Males								Females							
	Attempt (N = 31)		No Attempt (N = 788)		POR ^a		95% CI ^b		Attempt (N = 90)		No Attempt (N = 801)		POR		95% CI	
	%	N	%	N					%	N	%	N				
Major depression	64.5	20	9.5***	75	17.3	8.0, 37.5	55.6	50	21.3***	171	4.6	2.9, 7.2				
Dysthymia	6.5	2	2.2	17	3.1	0.7, 14.2	8.9	8	3.5*	28	2.7	1.2, 6.1				
Alcohol abuse dependence	19.4	6	3.7***	29	6.3	2.4, 16.5	14.4	13	3.7***	30	4.4	2.2, 8.7				
Drug abuse dependence	29.0	9	5.8***	46	6.6	2.9, 15.1	13.3	12	5.0**	40	2.9	1.5, 5.8				
Disruptive behavior disorder	32.3	10	9.3***	73	17.3	2.1, 10.5	12.2	11	3.9***	31	3.5	1.7, 7.1				
Adjustment disorder	6.5	2	5.2	41	1.3	0.3, 5.5	10.0	9	6.7	54	1.3	0.7, 3.2				
Anxiety disorder	9.7	3	5.5	43	1.9	0.5, 6.3	18.9	17	10.9*	87	1.9	1.1, 3.4				
Eating disorder	0.0	0	0.1	1	—	—	3.3	3	1.1	9	3.0	0.8, 11.4				
Any disorder	87.1	27	29.7***	234	16.0	5.5, 46.2	77.8	70	38.2***	306	5.7	3.4, 9.5				

^aPrevalence Odds Ratio (POR) = a measure of association between a risk factor, the diagnosis, and the occurrence of an event, an attempt. A POR of 1.00 indicates that the likelihood of the association between a diagnosis and an attempt is equal to chance. An estimate of the asymptotic standard error of the odds ratio can be used to approximate the confidence interval (CI) boundaries. If the value 1.0 falls within the 95% CI, the odds ratio is not significant at $p < 0.05$.

^b95% CI.

* χ^2 test significant at $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 2. Percentage of Attempters versus Nonattempters between T_1 and T_2 with a Diagnosis of Each DSM-III-R Mental Disorder during This Period

	Males								Females							
	Attempt (N = 8)		No Attempt (N = 690)		POR		95% CI		Attempt (N = 18)		No Attempt (N = 789)		POR		95% CI	
	%	N	%	N					%	N	%	N				
Major depression	37.5	3	4.8***	33	11.95	2.7, 52.1	61.1	11	9.6***	76	14.7	5.6, 39.2				
Alcohol abuse dependence	37.5	3	2.6***	18	22.4	5.0, 101.0	16.7	3	1.9***	15	10.3	2.7, 39.4				
Drug abuse dependence	12.5	1	2.9	20	4.8	0.6, 40.8	22.2	4	1.8***	14	15.8	4.6, 54.1				
Disruptive behavior disorder	0.0	0	0.9	6	—	—	5.6	1	0.3***	2	23.1	2.0, 267.7				
Adjustment disorder	0.0	0	1.6	11	—	—	5.6	1	4.3	34	1.3	0.2, 10.1				
Anxiety disorder	12.5	1	0.3***	2	49.1	4.0, 606.7	5.6	1	1.0	8	5.7	0.7, 48.5				
Eating disorder	0.0	0	0.0	0	—	—	5.6	1	0.9*	7	6.6	0.8, 56.4				
Any disorder	100.0	8	12.6***	87	—	—	94.4	17	19.1***	151	71.8	9.5, 543.9				

Note: POR = prevalence odds ratio; CI = confidence interval.

* χ^2 test significant at $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Prediction of Future Attempts

To investigate the contribution of past attempts, past ideation, and a past diagnosis of a psychiatric disorder to the probability of future attempts, the association between attempts, ideation, and psychiatric disorders before T_1 and an attempt between T_1 and T_2 were analyzed. Those who had attempted suicide before T_1 were approximately 20 times more likely to attempt between T_1 and T_2 than were those who had not previously attempted ($\chi^2 = 103.54$; $df = 1$; $N = 1505$; $p < 0.001$; POR = 20.0; CI = 2.0, 9.6). Over half (55.6%) of those who attempted between T_1 and T_2 had made previous attempts. Suicidal ideation before T_1 also predicted attempts between T_1 and T_2 ($\chi^2 = 16.28$; $df = 1$; $N = 1505$; $p < 0.001$; POR = 4.4; CI = 2.0, 9.6). More than one-third (40.7%) of the attempters between T_1 and T_2 had suicidal ideation before T_1 . The association between

suicidal ideation and future attempts remained after controlling for attempts before T_1 . More than one-half (58.3%) of those who attempted for the first time between T_1 and T_2 reported suicidal thoughts before T_1 ($\chi^2 = 15.43$; $df = 1$; $N = 1403$; $p < 0.01$; POR = 7.29; CI = 2.3, 23.2). Psychiatric disorders before T_1 also predicted an attempt between T_1 and T_2 ($\chi^2 = 12.25$; $df = 1$; $N = 1505$; $p < 0.001$; POR = 4.02; CI = 1.7, 9.3) as 69.2% of those who attempted between T_1 and T_2 met criteria for a diagnosis before T_1 . However, a diagnosis of a psychiatric disorder before T_1 , did not significantly predict a first attempt between T_1 and T_2 ($\chi^2 = 3.33$; $df = 1$; $N = 1403$; POR = 2.80; CI = 0.9, 8.9).

Discussion

Although this study has several strengths, including the

use of a structured interview and rigorous diagnostic criteria, it is also limited in several ways. Although results reported by Lewinsohn and associates (Lewinsohn et al., 1988) indicate that the sample is representative of those in high school, the results from this study may not be generalizable to those individuals not in high school. Adolescents with disorders that may have required them to be in an institution and those who dropped out of high school or were incarcerated were not included in the sample. A second limitation of this study is the low representation of racial and ethnic minorities in the population and thus in the sample. Approximately 10% of the sample were minorities, limiting the comparisons that could be made across ethnic and racial groups.

The lifetime prevalence of attempts of 7.1% and the 1-year period prevalence of 1.7% found in the present study, although surprisingly high, are consistent with other community-based studies (e.g., Dubow et al., 1989; Garrison et al., unpublished manuscript; Smith and Crawford, 1986). Similar to the results of other community studies (e.g., Shaffer et al., 1990), our data indicate that more females *attempted* suicide. However, in Oregon between 1983 and 1985, seven times more males than females *completed* suicide (Gebbie and Carney, unpublished manuscript). We, therefore, expected that male attempts, although less numerous, would be more lethal. Contrary to expectations and the findings of some researchers (Brent, 1987), but consistent with the findings of others (e.g., Kotila and Lonnquist, 1988), there was no gender difference in the lethality of the attempt.

Consistent with the work of others (Brent, 1987; Garfinkel et al., 1982), we found that the lethality and intent of the attempt are substantially correlated. This finding suggests that adolescents who seriously intend to commit suicide choose more lethal methods and those who choose lethal methods intend to commit suicide.

The lifetime prevalence of suicidal ideation (21.1%) reported here is comparable to that reported in the community study with high school students conducted by Velez and associates (Lewis et al., 1988; Velez and Cohen, 1988) using similar criteria and the same method of assessment, an interview, and is somewhat lower than the prevalence estimates obtained using self-report questionnaires (Smith and Crawford, 1986). The prevalence estimates reported here, however, are somewhat lower than those reported by Paykel et al. (1974) in their ground-breaking study with adults. Paykel et al. (1974) reported a lifetime prevalence of suicidal ideation, ranging from 11.5% for thoughts that life was not worth living to 2.6% for seriously considered taking life, which can be compared to the lifetime prevalence estimates for similar questions found in the present study with adolescents (which ranged from 16.3% for thoughts of death to 8.3% for having a plan). Paykel et al. (1974) also reported that the lifetime prevalence in their sample was slightly less than two times the 1-year prevalence. They suggested that this relationship between 1-year and lifetime prevalence was the result of either chronic suicidal ideation or under-reporting. Our findings with adolescents suggest that the low lifetime prevalence found by Paykel et al. (1974) may be

the result of under-reporting, perhaps because of poor recall of suicidal thoughts in their youth by older adults.

Similar to the results reported by Paykel et al. (1974), we found successive declines in the proportion who endorsed each suicidal ideation item ranging from thoughts of death to having a plan. This finding and the high internal consistency among items suggest that suicidal ideation represents a single dimension. Our data also indicate that suicidal ideation and attempts were overlapping distributions, with many first time attempters experiencing suicidal ideation before their first attempt. Thus, these findings support conceptualizing suicidal behavior as being on a continuum (Bonner and Rich, 1987; Brent et al., 1986; Dubow et al., 1989; Menninger, 1938; Paykel et al., 1974).

The results from this study indicate that suicidal attempts typically occur in conjunction with a mental disorder. Writing in 1974, Shaffer suggested that two different types of suicidal children can be identified: those who are prone to be aggressive, anti-social, and who cause trouble at school; and those who are relatively isolated from others and who appear depressed and withdrawn. The findings from this study strongly support this formulation as suicide attempts were associated with diagnoses of depressive, substance use, and disruptive behavior disorders. Attempts most often occurred with a diagnosis of a depressive disorder and occurred during the episode.

More recently, Shaffer (1988) suggested that suicidal behavior in boys is more likely to be associated with antisocial behavior; whereas suicidal behavior in girls is more likely to be associated with depression. However, the findings from this study do not support Shaffer's suggestion. First, contrary to Shaffer's suggestion, proportionately more male than female attempters had a diagnosis of depression before T₁. Furthermore, gender differences in the relative prevalence of disruptive behavior disorders, alcohol abuse dependence, or drug abuse disorders among attempters were not found in this study.

Some of the results of the Epidemiological Catchment Area (ECA) study (Johnson et al., 1990; Weissman et al., 1989) with adults differs from those obtained with our sample of adolescents. Specifically, in the ECA study, suicide attempts occurred relatively more often with panic disorders than with other psychiatric disorders. In their study, 20% of the adults with a lifetime diagnosis of panic disorder attempted suicide. In contrast, in this study, we found no association between panic disorder and attempts. Not one of the 14 adolescents with a lifetime history of panic disorder attempted suicide.

The findings from this study have implications for the prediction and prevention of suicidal attempts among adolescents. Although the assumption that suicide attempters are similar to those adolescents who complete suicide may not be valid, the findings from this study may also have implications for the prediction and prevention of completed suicides among adolescents. The results suggest that the following factors may be useful to identify those high school students most likely to be at risk for an attempt and to identify variables which can be targeted in an intervention: (1) demographic variables such as being female, being from

a father-absent home, and having a father without a college degree; (2) having suicidal ideation or thoughts; (3) having had a diagnosed mental disorder, in particular, an affective, substance use or disruptive behavior disorder; and (4) having made a previous attempt.

References

- American Psychiatric Association (1987), *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition-revised (DSM-III-R)*. Washington, DC: American Psychiatric Association.
- Beck, A. T., Kovacs, M. & Weissman, A. (1979), Assessment of suicidal ideation: the scale for suicide ideation. *J. Consult. Clin. Psychol.*, 47:343-352.
- Berman, A. L. & Schwartz, R. H. (1990), Suicide attempts among adolescent drug users. *Am. J. Dis. Child.*, 144:310-314.
- Beskow, J., Runeson, B. & Asgard, U. (1990), Psychological autopsies: methods and ethics. *Suicide Life Threat. Behav.*, 20:307-323.
- Bettes, B. A. & Walker, E. (1986), Symptoms associated with suicidal behavior in childhood and adolescence. *J. Abnorm. Child Psychol.*, 14:591-604.
- Bonner, R. L. & Rich, A. R. (1987), Toward a predictive model of suicidal ideation and behavior: some preliminary data in college students. *Suicide Life Threat. Behav.*, 17:50-63.
- Brent, D. A. (1987), Correlates of medical lethality of suicide attempts in children and adolescents. *J. Am. Acad. Child Adolesc. Psychiatry*, 26:87-89.
- Kalas, R., Edelbrock, C., Costello, A., Dulcan, M. & Conover, N. (1986), Psychopathology and its relationship to suicidal ideation in childhood and adolescence. *J. Am. Acad. Child Adolesc. Psychiatry*, 25:666-673.
- Kolko, D. J., Allan, M. J. & Brown, R. V. (1990), Suicidality in affectively disordered adolescent inpatients. *J. Am. Acad. Child Adolesc. Psychiatry*, 29:586-593.
- Cairns, R. B., Peterson, G. & Neckerman, H. J. (1988), Suicidal behavior in aggressive adolescents. *J. Clin. Child Psychol.*, 17:298-309.
- Carlson, G. A. & Cantwell, D. P. (1982), Suicidal behavior and depression in children and adolescents. *J. Am. Acad. Child Adolesc. Psychiatry*, 21:361-368.
- Chambers, W. J., Puig-Antich, J., Hirsch, M., Paez, P., Ambrosini, P. J., Tabrizi, M. A. & Davies, M. (1985), The assessment of affective disorders in children and adolescents by semi-structured interview: test-retest reliability of the K-SADS-P. *Arch. Gen. Psychiatry*, 42:696-702.
- Deykin, E. Y., Perlow, R. & McNamarra, J. (1985), Non-fatal suicidal and life-threatening behavior among 13-17 year old adolescents seeking emergency medical care. *Am. J. Public Health*, 75:90-92.
- Dubow, E. F., Kausch, D. F., Blum, M. C., Reed, J. & Bush, E. (1989), *J. Clin. Child Psychol.*, 18:158-166.
- Fowler, R. C., Rich, C. L. & Young, D. (1986), San Diego suicide study: II. Substance abuse in young cases. *Arch. Gen. Psychiatry*, 43:962-965.
- Gammon, G. D., John, K. & Weissman, M. M. (1986), Adolescent suicide: epidemiology, research and prevention. In *Advances in Adolescent Mental Health*, Vol. 1, eds. R. A. Feldman & A. R. Stiffman. Greenwich, CT: JAI Press, pp. 91-118.
- Garfinkel, B., Foese, A. & Hood, J. (1982), Suicide attempts in children and adolescents. *Am. J. of Psychiatry*, 139:1257-1261.
- Garrison, C. Z., Jackson, K. L., Addy, C. L., McKeown, R. E. & Waller, J. (1991), Suicidal behaviors in young adolescents. *Am. J. Epidemiol.*, 133:1005-1014.
- Goldney, R. & Pilowsky, I. (1980), Depression in young women who have attempted suicide. *Aust. N.Z. J. Psychiatry*, 14:203-211.
- Harkavy Friedman, J. M. H., Asnis, G. M., Boeck, M. & DiFiore, J. (1987), Prevalence of specific suicidal behaviors in a high school sample. *Am. J. Psychiatry*, 144:1203-1206.
- Joffe, R. T., Offord, D. R. & Boyle, M. H. (1988), Ontario Child Health Study: suicidal behavior in youth age 12-16 years. *Am. J. Psychiatry*, 145:1420-1422.
- Johnson, J., Weissman, M. M. & Klerman, G. L. (1990), Panic Disorder, comorbidity and suicide attempts. *Arch. Gen. Psychiatry*, 47:805-808.
- Kandel, D. (1988), Substance use, depressive mood, and suicidal ideation in adolescence and young adulthood. In: *Advancement in Adolescent Mental Health*, eds. A. R. Stiffman & R. A. Feldman. Greenwich, CT: JAI Press, pp. 127-142.
- Kosky, R., Silburn, S. & Zubrick, S. R. (1990), Are children and adolescents who have suicidal thoughts different from those who attempt suicide? *J. Nerv. Ment. Dis.*, 178:38-43.
- Kotila, L. & Lonnquist, J. (1988), Adolescent suicide attempts: sex differences predicting suicide. *Acta Psychiatr. Scand.*, 77:264-270.
- Lewinsohn, P. M., Hops, H., Roberts, R., Seeley, J. R. & Andrews, J. A. (1988, November), *Adolescent depression: prevalence and psychosocial aspects*. Paper presented at the annual meeting of the American Public Health Association, Boston, MA.
- Lewinsohn, P. M., Rohde, P., Seeley, J. R., Hops, H. (1991), The comorbidity of unipolar depression: I. Major depression with dysthymia. *J. Abnorm. Psychol.*, 100:205-213.
- Lewis, S. A., Johnson, J., Cohen, P., Garcia, M. & Velez, C. N. (1988), Attempted suicide in youth: its relationship to school achievement, educational goals, and socioeconomic status. *J. Abnorm. Child Psychol.*, 16:459-471.
- Maris, R. (1985), The adolescent suicide problem. *Suicide Life Threat. Behav.*, 15:91-109.
- Marzuk, P. M. & Mann, J. J. (1988), Suicide and substance abuse. *Psychiatric Annals*, 18:639-645.
- Menninger, K. A. (1938), *Man against Himself*. New York: Harcourt, Brace & Company.
- National Center for Health Statistics (1988), *Mortality*, Vol. 2, Part A, (DHS) Washington, DC: Public Health Service. PHS 91-1101.
- Orvaschel, H. & Puig-Antich, J. (1986), *Schedule for Affective Disorder and Schizophrenia for School-age Children. Epidemiologic version: Kiddie-SADS-E (K-SADS-E)* (4th version). Technical report. Pittsburgh, PA: Western Psychiatric Institute and Clinic.
- Paykel, E. S., Myers, J. K., Lindenthal, J. J. & Tanner, J. (1974), Suicidal feelings in the general population: A prevalence study. *Br. J. Psychiatry*, 124:460-469.
- Puig-Antich, J. & Chambers, W. J. (1983), *Schedule for Affective Disorders and Schizophrenia for School age Children* (6-18). Technical report. Pittsburgh, PA: Western Psychiatric Institute and Clinic.
- Robbins, D. R. & Alessi, N. E. (1985), Depressive symptoms and suicidal behavior in adolescents. *Am. J. Psychiatry*, 142:588-592.
- Rosenberg, M. L., Smith, J. C., Davidson, L. E. & Conn, J. M. (1987), The emergence of youth suicide: An epidemiologic analysis and public health perspective. *Annu. Rev. Public Health*, 8:417-427.
- Schuckit, M. A. & Schuckit, J. J. (1991), Substance use and abuse: a risk factor in youth suicide. In *Risk Factors for Youth Suicide*, eds. L. Davidson & M. Linnoila. NY: Hemisphere, pp. 156-167.
- Shaffer, D. (1974), Suicide in childhood and early adolescence. *J. Child Psychol. Psychiatry*, 15:275-291.
- (1988), The epidemiology of teen suicide: an examination of risk factors. *J. Clin. Psychiatry*, 49:36-41.
- Vieland, V., Garland, A., Rojas, M., Underwood, M. & Busner, C. (1990), Adolescent suicide attempters: response to suicide-prevention programs. *J.A.M.A.*, 264:3151-3155.
- Shaffi, M., Steltz-Lenarsky, J., Derrick, A. M., Beckner, C. & Whittinghill, J. R. (1988), Comorbidity of mental disorders in the post-mortem diagnosis of completed suicide in children and adolescents. *J. Affective Disord.*, 15:227-233.
- Shapiro, R. & Keller, M. (1979), *Longitudinal Interval follow-up Evaluation (LIFE)*. Boston: Massachusetts General Hospital.
- Smith, K., Conroy, R. W. & Ehler, B. D. (1984), Lethality of suicide attempt rating scale. *Suicide Life Threat. Behav.*, 14:215-242.
- Crawford, S. (1986), Suicidal behavior among "normal" high school students. *Suicide Life Threat Behav.*, 16:313-325.
- Stiffman, A. R., Earls, F., Robins, L. N. & Powell, J. (1988), The relationship between adolescent depression and suicide attempts. In: *Advances in Adolescent Mental Health*, eds. A. R. Stiffman & R. A. Feldman. Greenwich, CT: JAI Press.
- Velez, C. N. & Cohen, P. (1988), Suicidal behavior and ideation in a

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- community sample of children: maternal and youth reports. *J. Am. Acad. Child Adolesc. Psychiatry*, 27:349-356.
- Weissman, M. M., Klerman, G. L., Markowitz, J. S. & Ouellette, R. (1989), Suicidal ideation and suicide attempts in panic disorder and attacks. *N. Engl. J. Med.*, 321:1209-1214.
- Younger, S. C., Clark, D. C., Oehmig-Lindroth, R. & Steins, R. J. (1990), Availability of knowledgeable informants for a psychological autopsy study of suicides committed by elderly people. *J. Am. Geriatr. Soc.*, 38:1169-1175.