

Examination of Affective, Cognitive, and Behavioral Factors and Suicide-Related Outcomes in Children and Young Adolescents

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Examined the role of affective, cognitive, and behavioral factors in the occurrence of suicidal ideation, suicide attempts, and suicidal intent in child and young adolescent (N = 175, ages 6 to 13 years) psychiatric inpatients. The results indicated that (a) self-reported depressed mood, negative automatic thoughts, hopelessness about the future, and anhedonia were all significantly associated with suicide-related outcomes, and these relations remained statistically significant even after depressed mood was controlled; (b) suicidal participants (both ideators and attempters) were distinguished from nonsuicidal participants by higher scores on measures of depressed mood, negative automatic thoughts, and hopelessness; and (c) participants who reported making a suicide attempt were distinguished from those who did not by higher scores on a measure of anhedonia and a higher number of previous suicide attempts. The results demonstrate the importance of negative automatic thoughts and anhedonia, and provide support for the role of hopelessness and previous suicide attempts in the occurrence of different suicide-related outcomes in children and young adolescents.

Suicide is currently the sixth leading cause of death in children¹ ages 5 to 14 years old in the United States (Hoyert, Kochanek, & Murphy, 1999). Moreover, the rate of completed suicide has more than doubled among children 10 to 14 years old in the United States from 1980 to 1997 (.76/100,000 to 1.59/100,000; Centers for Disease Control and Prevention, 2000). Although the base rate of completed suicide in this young group is quite low, the presence of suicidal ideation and attempts are much more common. For example, a recent study of all psychiatric emergency room visits for individuals younger than 16 years of age seen in a major metropolitan hospital over a 10-year period reported that 30% of all visits were due primarily to suicidal ideation, and an additional 17% were due to suicidal behavior (Peterson, Zhang, Lucia, King, & Lewis, 1996). Such high rates of suicidal ideation and behavior are of great concern considering the potential for serious injury and death, as well as the elevated levels of psychological distress, associated with each incident.

Despite the scope of the problem, suicide continues to receive little research attention, and existing work has been limited in several ways. First, the vast majority of suicide-related research has focused on adults and more recently on adolescents, whereas research on children has been quite limited. Second, most research on suicide has focused on the relation between depression and suicide-related outcomes and has failed to identify psychological characteristics, independent of depression, that might be useful in the prediction of suicide. Third, researchers have been inconsistent in labeling, operationalizing, and examining different suicide-related outcomes. For example, researchers often refer to individuals as “suicidal” or displaying “suicidality” without distinguishing between those who have had only thoughts about suicide (i.e., suicide ideators) versus those that report actual attempts to end their lives (i.e., suicide attempters). Also, researchers rarely report individuals’ actual *intent to die* as a result of their actions (see O’Carroll et al., 1996). This vagueness and inconsistency has made findings difficult to compare across studies and has limited the growth of this area of research (Linehan, 1997). This study was designed to address these limitations and to provide new information about factors associated with suicide-related outcomes in children.

Although there are many proposed predictors of suicide-related outcomes, those that are potentially modifiable are of greatest concern for implementing prevention and intervention strategies and have thus been the focal point of research. Most notably, depres-

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¹Throughout this article we use the term *children* to refer to children and young adolescents ages 6 to 13 years old unless otherwise indicated.

sion has been associated with suicidal ideation and attempts in adults, adolescents, and children (e.g., Malone, Haas, Sweeney, & Mann, 1995; Shaffer et al., 1996). However, most children with a depressed mood will never attempt or complete suicide, and many will never even experience suicidal ideation (Ryan et al., 1987). Therefore, depressed mood, by itself, is of limited usefulness in predicting who will actually become suicidal; and it is likely that affective, cognitive, and behavioral variables other than depressed mood are related to the development of suicidal ideation and attempts.

Typically, suicidal ideation and attempts are preceded by common, stressful life events (Spirito, Overholser, & Stark, 1989). The ways children perceive and evaluate such events, and their resulting thoughts, may be an important consideration for identifying those who are potentially suicidal. Beck, Kovacs, and Weissman (1975) postulated that depression and suicidal ideation and attempts are results of a person's "cognitive distortions," through which an individual systematically misconstrues the environment in a negative way. Although these cognitive distortions are not directly observable, it is possible to assess their presence by measuring the content and frequency of an individual's "negative automatic thoughts." Negative automatic thoughts are private, spontaneous, intrusive, negative statements believed to represent an individual's underlying belief system. Indeed, negative automatic thoughts occur significantly more frequently in depressed than in nondepressed adults and children (Holln & Kendall, 1980; Kazdin, 1990).

Despite the fact that negative automatic thoughts have been linked to depressed mood and the modification of negative automatic thoughts has featured prominently in treatments for suicidal children and adolescents (e.g., Brent & Poling, 1997), the relation between the frequency of negative automatic thoughts and suicidal ideation and attempts has not been examined empirically. Following the logic of Beck and colleagues (1975) that suicidal ideation and attempts are the result of cognitive distortions, children who are currently suicidal would be expected to experience an increased frequency of negative automatic thoughts. An increased frequency of negative automatic thoughts may make the experience of stressors less tolerable for some children, and these children may resort to suicidal ideation or attempts as an attempt to escape such thoughts.

Hopelessness about the future is a cognitive construct that has received a large amount of attention in the suicide research literature. Adults who are hopeless are particularly vulnerable to contemplate and complete suicide (Beck et al., 1975; Brown, Beck, Steer, & Grisham, 2000). However, hopelessness has been related to the severity of suicidal ideation in children in some studies (Abramson et al., 1998; Marciano & Kazdin, 1994) but not others (Asarnow, Carlson, &

Guthrie, 1987). Thus, although hopelessness has been associated with suicidal outcomes in general, the nature of this relation in children in whom cognitive abilities and characteristics differ from those of adults remains unclear.

In terms of affective characteristics, *either* depressed mood or a diminished capacity for pleasurable experiences, referred to as anhedonia, is required to make a diagnosis of major depression (American Psychiatric Association, 1994). Although the presence of a depressed mood may be the symptom most likely to prompt clinicians to assess the suicide potential of their client(s), there is reason to expect that a decrease in an individual's ability to experience pleasure may predict suicidal behavior. Such a hypothesis is consistent with the theory that suicidal behavior represents an attempt to escape from an intolerable situation from which a person does not feel or expect relief (e.g., Baumeister, 1990; Hawton, Cole, O'Grady, & Osborn, 1982). The experience of anhedonia may be particularly intolerable and thus likely to lead to suicidal behavior, regardless of the presence of a depressed mood. Indeed, individuals whose depression is characterized by anhedonia may be more likely than those without anhedonia to experience suicidal ideation (Klein, 1974).

Most individuals with a diagnosis of depression experience depressed mood; however, previous research in an adult sample has shown that only a small subgroup (approximately 12%) report significantly increased anhedonia (Fawcett, Clark, Scheftner, & Gibbons, 1983). More recently, Fawcett and colleagues (1990) found that anhedonia is a better short-term predictor (within 1 year) of completed suicide in adults than any other symptom of depression, including suicidal ideation. Moreover, anhedonia is stable over time, indicating that it may be a good marker for suicide attempts (Clark, Fawcett, Salazar-Grueso, & Fawcett, 1984). Anhedonia has been reported in depressed children as young as 4 years old (via a comprehensive interview with children and their parents; Kashani & Carlson, 1987); however, the role of anhedonia in the occurrence of suicidal ideation and attempts among children has not received empirical attention.

Although progress in identifying factors associated with suicide-related outcomes in children has been slow, attempts to identify factors that differ *among* "suicidal" children (e.g., between ideators and attempters) have been even less successful. For example, several factors that have been reported to differ between adolescent suicide ideators and attempters, such as frequency of suicidal ideation and a history of previous suicide attempts (Negron, Piacentini, Graae, Davies, & Shaffer, 1997; Shaffer et al., 1996), have not been shown to do so in children (e.g., Cohen-Sandler, Berman, & King, 1982; Marciano & Kazdin, 1994). The identification of factors that differ between children who only think about suicide and those who actu-

ally attempt to kill themselves has important implications for the improved prediction of attempted suicide in children.

This study examined the relations among affective, cognitive, and behavioral factors and different suicide-related outcomes in children recently admitted to a child inpatient unit. The initial hypotheses were that depressed mood, negative automatic thoughts, hopelessness, and anhedonia would be associated with (a) suicidal ideation; (b) the presence of a current suicide attempt (i.e., immediately prior to admission); and (c) suicidal intent (i.e., the extent to which those made a suicide attempt reported actually intending to die as a result of that behavior), and that measures of negative automatic thoughts, hopelessness, and anhedonia would be related to these outcomes even after controlling for depressed mood. The second set of hypotheses proposed that there would be significant affective, cognitive, and behavioral differences among children who were nonsuicidal, suicidal ideators, or suicide attempters. Specifically, we expected that depressed mood, negative automatic thoughts, hopelessness, and anhedonia would be higher in children reporting current suicidal ideation than in nonsuicidal children and that measures of those constructs, as well as suicidal ideation, would be highest in children reporting a current suicide attempt. In addition, we expected that children who reported a current suicide attempt would report a higher number of previous suicide attempts than children who did not make a current suicide attempt.

Method

Participants

Participants were 175 children (122 boys, 53 girls) and their mothers (or maternal guardian). The children were consecutive admissions to an acute-care, 22-bed inpatient facility for children ages 6 to 13 years. To be included, children were required to be at least 6 years old and to have no evidence of neurological impairment, uncontrolled seizures, or dementia. Participants were also required to receive a Full Scale Intelligence Quotient (FSIQ) of 70 or above on the Wechsler Intelligence Scale for Children–Revised (Wechsler, 1974). The children ranged in age from 6.8 to 13.9 years ($M = 11.1$, $Mdn = 11.3$, $mode = 11.0$, $SD = 1.7$) and had Wechsler Intelligence Scale for Children–Revised full-scale scores from 70 to 127 ($M = 95.0$, $SD = 12.4$). Only a general classification of ethnicity was made at admission, and as such, 117 (66.9%) of the children were classified as Caucasian, and 58 (33.1%) were non-Caucasian (over 95% of the non-Caucasian sample was African American). All children lived with their mother or female guardian, who ranged in age from 24 to 63 years ($M = 34.5$, $SD = 7.0$). Family socio-

economic status, calculated by the Hollingshead and Redlich (1958) two-factor index, yielded the following breakdown (ranging from lowest to highest socioeconomic status): Class V: 73.3%, IV: 11.9%, III: 11.9%, II: 2.0%, and I: 1.0 %. The estimated monthly income for the families ranged from \$0 to \$500 to > \$2,500 ($Mdn = \0 –\$500), and 61.5% of the families reported that they were currently receiving public assistance.

Diagnoses of the children were based on the criteria of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; American Psychiatric Association, 1980) and were obtained from separate interviews with all children and their guardians at admission using the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (K-SADS; Chambers, Puig-Antich, & Tabrizi, 1978) and from psychiatric evaluations after the children had been admitted. Using these sources of information, two staff members independently completed diagnoses for each child. The interviewers (MA or PhD level) were trained in the use of the K-SADS and had experience (2 to 5 years) in its administration. Agreement on principal Axis I diagnosis was relatively high ($\kappa = .70$). In the event of disagreement, the case was discussed in order to reach consensus on the appropriate diagnosis. Primary Axis I diagnoses included: major depression ($n = 26$), conduct disorder ($n = 85$), oppositional defiant disorder ($n = 17$), attention deficit disorder ($n = 11$), anxiety disorders ($n = 12$), adjustment disorders ($n = 14$), and other disorders ($n = 10$). Eighty-five (48.6%) children met criteria for more than one Axis I diagnosis.

Procedures

All parents (100%) and children over 7 years old provided written informed consent to participate in the study, which was approved by the university hospital's Institutional Review Board. All children were administered the measures described below within the first 7 to 10 days after admission by the interviewer reading the questions and response alternatives aloud and recording the child's verbal responses.

Measures

Depressed mood and anhedonia. All children were administered the Children's Depression Scale (CDS; Lang & Tisher, 1978) as a continuous measure of depressed mood and anhedonia. The CDS is a 66-item scale that is divided into two major subscales of depressed mood (CDS-D; 48 items) and pleasurable experiences/anhedonia (CDS-A; 18 items). The depressed mood subscale includes six subscales that closely reflect diagnostic criteria for major depression (e.g., sad affect, social problems, low self-esteem, preoccupation with sickness and death, and feelings of guilt). The anhedonia subscale includes two subscales

that measure pleasure and enjoyment (e.g., "I get a lot of fun out of the things I do," "I enjoy myself most of the time") and miscellaneous pleasure items (e.g., "I feel proud of most of the things I do"). The authors of the CDS proposed that the anhedonia subscale is a measure of the child's capacity to experience pleasure (Lang & Tisher, 1978).

The CDS is unique in its use of a separate subscale to measure anhedonia and a novel assessment format (card sort) that was designed to reduce stereotypic responding. Each CDS item is printed on a separate index card that is read to the child. The child then places the card in one of five premarked boxes that reflect a Likert-type scale ranging from 1 (*very wrong* [unlike me]) to 5 (*very right* [like me]). Higher scores on the scales indicate a greater degree of depressed mood or anhedonia.

The CDS has been shown to have good internal consistency for the depressed mood and anhedonia subscales (coefficient $\alpha = .94$ and $.85$, respectively), to correlate moderately with other measures of child depression and self-esteem, and to discriminate between children diagnosed by structured interview with major depression and nondepressed children, thus supporting the convergent and discriminant validity of this measure in a child inpatient sample (ages 7 to 12 years; Kazdin, 1987). Additional validity data for the CDS, as well as the Hopelessness Scale for Children (HSC; Kazdin et al., 1986) and the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) described below, involving participants from this sample have been reported elsewhere (Kazdin, 1987, 1990; Kazdin, Rodgers, & Colbus, 1986).

Negative automatic thoughts. All children were administered the ATQ (Hollon & Kendall, 1980) to assess the occurrence of covert, spontaneous negative, intrusive self-statements. The ATQ contains 30 negative self-statements, and the child is asked to indicate the extent to which each thought has occurred in the past week. The responses are provided on a Likert-type scale ranging from 1 (*not at all*) to 5 (*all the time*). A higher total score indicates more frequent negative automatic thoughts. Although the ATQ was originally developed for use with adults, it has been shown to have good psychometric properties in child samples (Kazdin, 1990). The ATQ is internally consistent (coefficient $\alpha = .96$) and shows construct validity by being correlated positively with severity of depression, hopelessness, and external locus of control and negatively with self-esteem in a child inpatient sample (ages 6 to 13 years; Kazdin, 1990).

Hopelessness. To measure hopelessness, children completed the HSC (Kazdin et al., 1986). The HSC is a 17-item, true/false measure, adapted for use with children from the original 20-item Beck Hopelessness

Scale (Beck, Weissman, Lester, & Trexler, 1974), which measures a child's negative expectations about the future. A higher total score (range = 0 to 17) indicates greater hopelessness or more negative expectations. The HSC has been shown to have good internal consistency (coefficient $\alpha = .97$) and to correlate positively with measures of depression and negatively with measures of self-esteem, supporting its construct validity in a child inpatient sample (ages 6 to 13 years; Kazdin, French, Unis, Esveltd-Dawson, & Sherick, 1983). The HSC was not included in the assessment battery until after data collection for this study had already begun; therefore HSC data were available for only 150 of the 175 participants.

Suicidal ideation. All participants were administered a modified version of the Scale for Suicidal Ideation (SSI; Beck, Kovacs, & Weissman, 1979). The original SSI is a semistructured interview developed for use with adults that assesses the presence, frequency, and intensity of current thoughts about death and suicide. This study used 14 of the original 19 items. To render the scale more appropriate for use with young children, 5 of the original items were excluded, and the wording of the remaining items was standardized to ensure that the items were consistently administered and were easily understandable for young children. As with the original scale, three statements of increasing intensity followed each question, and the participants selected the statement that most accurately reflected their current thoughts about death and suicide (1 = *no suicidal ideation* to 3 = *severe suicidal ideation*). Children who did not endorse suicidal ideation on the first several "screeners" items were not administered the remaining items. This technique is consistent with recommendations made by the authors of the SSI (Beck & Steer, 1991).

The SSI has been used widely and its psychometric properties have been demonstrated to be adequate in adolescent (Steer, Kumar, & Beck, 1993) and child (Allan, Kashani, Dahlmeier, Taghizadeh, & Reid, 1997) inpatient populations. In a recent study examining the psychometric properties of the SSI with inpatient children (ages 7 to 12 years), a principal-components analysis resulted in deletion of 3 of the 5 items excluded from the measure used in this study (Allan et al., 1997). In addition, the authors reported that the SSI was internally consistent (coefficient $\alpha = .88$) and was significantly and positively related with suicide-related questions from the depression scale and structured interview used in that study, supporting the construct validity of the SSI in child inpatient populations (Allan et al., 1997). Similarly, the version of the SSI used in this study was internally consistent (coefficient $\alpha = .94$) and was significantly and positively correlated with the suicide question from the K-SADS structured interview ($r [N = 175] = .52, p < .001$) and with scores on

the Suicide Intent Scale (described later; $r [n = 39] = .76, p < .01$), supporting the reliability and construct validity of this version of the SSI and its use in this sample.

Suicide attempts. All children were coded dichotomously on “current suicide attempt” according to their response to the question of whether they “tried to kill [themselves]” immediately prior to the current inpatient admission. In addition, all children were coded continuously on “past suicide attempts” according to their response to the question of whether they “tried to kill [themselves]” in the past 12 months, and if so “how many times?” This variable was calculated excluding any suicide attempt related to the current admission. Parents and guardians were also asked about current and past suicide attempts by their child and moderate agreement was obtained (e.g., $\kappa = .57$ for presence of a current suicide attempt); however, to be consistent with the assessment of suicidal ideation and intent, only child report of suicide attempts was used in the analyses reported below.

Suicidal intent. Children who reported a current suicide attempt were administered the Suicidal Intent Scale (SIS; Beck, Schuyler, & Herman, 1974), a 15-item measure of an individual’s intent to die as a result of self-injurious behavior. The SIS was also originally developed for use with adults and has been used widely with adults and adolescents (Goldston, 2000). All 15 items from the original SIS were retained, and the wording was standardized to ensure that the items were consistently administered and were easily understandable for young children. The format of the SIS includes three statements of increasing intensity for each item, and the content of the items includes information about different aspects

of the child’s suicide attempt such as premeditation, degree of planning, and precautions against discovery; communication of intent; and expectations regarding fatality of the act. The SIS has been reported to be internally consistent (coefficient $\alpha = .85$) in adolescent suicide attempters (Spirito, Sterling, Donaldson, & Arrigan, 1996), and total scores on the SIS were correlated with severity of depression, hopelessness, and suicidal ideation (Spirito et al., 1996). Similarly, in this study the SIS was highly correlated with the suicide question from the K-SADS ($r [N = 175] = .72, p < .001$) and with scores on the SSI (as reported previously), supporting the construct (convergent) validity of the SIS and its use in child populations.

Suicide group classification. Based on the results of the suicide assessment, we classified participants into one of three mutually exclusive groups. Those children who endorsed no suicidal ideation on the SSI and reported no current suicide attempt were classified as “nonsuicidal.” Children who endorsed any suicidal ideation on the SSI, but no current suicide attempt were classified as having “suicidal ideation,” and children who reported a current suicide attempt (i.e., immediately prior to admission) were classified as “suicide attempters.”

Results

Preliminary Analyses

Demographic characteristics of the sample and a breakdown according to suicide classification are presented in Table 1. Separate analyses of variance (ANOVAs) for continuous variables and chi-square tests for categorical variables revealed no differences

Table 1. Sample Characteristics according to Suicide Group Classification

	Total ^a	Nonsuicidal ^b	Suicidal Ideation ^c	Current Suicide Attempt ^d
Age				
<i>M</i> (<i>SD</i>)	11.1 (1.7)	11.1 (1.7)	10.9 (1.6)	11.3 (1.6)
Range	6.8–13.9	7.3–13.9	6.8–13.0	7.6–13.9
Race (<i>n</i> [row %])				
White	117	59 (50.4)	34 (29.1)	24 (20.5)
Non-White	58	28 (48.3)	15 (25.9)	15 (25.9)
Gender				
Male	122	70 (57.4)	32 (26.6)	20 (16.4)
Female	53	17 (32.1)	17 (32.1)	19 (35.8)
Socioeconomic status				
Hollingshead score				
<i>M</i> (<i>SD</i>)	62.7 (14.8)	63.7 (13.6)	61.2 (15.2)	62.4 (17.2)
DSM diagnosis (<i>n</i> [row %])				
Internalizing disorders	39	18 (46.2)	8 (20.5)	13 (33.3)
Externalizing disorders	113	60 (53.1)	33 (29.2)	20 (17.7)
Other disorders	23	9 (39.1)	8 (34.8)	6 (26.1)

Note: DSM = Diagnostic and Statistical Manual of Mental Disorders (3rd ed.; American Psychiatric Association, 1980).

^a $N = 175$. ^b $n = 87$. ^c $n = 49$. ^d $n = 39$.

between suicide groups in age, ethnicity, or socioeconomic status. Overall, girls were more than twice as likely as boys to report a current suicide attempt (35.8% and 16.4%, respectively; $\chi^2[1, N = 175] = 8.08$, $p < .01$). However, this was true for older (defined by median split at 11.25 years) girls versus boys (41.4% and 13.6%, respectively; $\chi^2[1, n = 88] = 8.57$, $p < .01$), but not for younger ones (29.2% and 19.0%, respectively; $\chi^2[1, n = 87] = 1.04$, *ns*). Because there were not enough children in each primary diagnostic category listed previously to analyze them separately, we classified all children according to the overall nature of their primary Axis I diagnosis and examined diagnostic differences among the three suicide groups. There were no significant differences among the groups in the proportion of children with externalizing (conduct, oppositional, and attention deficit disorders); internalizing (depressive and anxiety disorders); and other (adjustment disorder and other disorders) problems ($\chi^2[4, N = 175] = 5.42$, *ns*).

To evaluate whether the affective and cognitive variables differed as a function of participant and demographic variables, separate *t* tests were completed according to different categorical characteristics of the children (sex and ethnicity), and correlations were used to examine continuous variables (age, IQ, family income, and Hollingshead score). Significant overall effects were obtained for total ATQ scores as a function of sex ($t[N = 175] = 2.18$, $p < .05$), showing that girls ($M = 75.7$, $SD = 32.0$) reported higher negative automatic thoughts than boys ($M = 65.2$, $SD = 27.8$). In addition, small, but statistically significant, negative correlations were identified between child's age and ATQ scores ($r[N = 175] = -.16$, $p < .05$) and between FSIQ and HSC scores ($r[N = 175] = -.19$, $p < .05$). No other effects were obtained as a function of participant or demographic variables. Due to the possible confounding effect of child age and FSIQ, we initially controlled for these variables; however, the results of the age- and IQ-corrected analyses were virtually identical to the uncorrected analyses. Because age and IQ were unrelated to all suicide-related variables and groups, and for the purposes of space and clarity, only the uncorrected analyses are presented below. Because sex was

significantly associated with suicide-related outcomes, rather than controlling for sex, we repeated all analyses separately for boys and girls and examined any sex differences that emerged. In addition, it is notable that given the sample size and selected alpha level (.05, two-tailed tests), this study had adequate power to detect the medium and large effect sizes expected (power = .76 and .99 for medium and large effects, respectively).

Relations Among Affective and Cognitive Measures

The constructs of depressed mood, negative automatic thoughts, and hopelessness are known to be moderately intercorrelated in children (Kazdin, 1990). To examine their relation with anhedonia, and to examine whether the measures were redundant, we examined the intercorrelations of the affective and cognitive measures for the entire sample (see Table 2). As expected, the correlations between depressed mood, negative automatic thoughts, and hopelessness ($r[s\ n = 150] = .51$ to $.73$) were higher than those between anhedonia and the other measures ($r[s\ n = 150\ to\ 175] = .37$ to $.44$). These correlations are directly interpretable as effect sizes; the correlations among the former variables all represent large effects (i.e., $r \geq .50$ denotes a large effect) and the associations between the latter variables represent medium effects (i.e., $r = .30$ denotes a medium effect; Cohen, 1969). These correlations indicate shared variance between 14% and 53% among these constructs. Thus, whereas expected overlap existed among the measures, there was considerable unshared variance among them. Therefore, the affective and cognitive constructs were considered significantly associated, but not redundant, and therefore all measures were retained for subsequent analyses.

Relations Between Affective and Cognitive Measures and Suicide-Related Outcomes

The first set of hypotheses stated that affective and cognitive factors would be correlated with scores on

Table 2. Ranges, Means, Standard Deviations, and Correlation Matrix for Affective and Cognitive Measures

Measure	Range	<i>M</i>	<i>SD</i>	Correlations			
				CDS-D	ATQ	HSC	CDS-A
CDS-D	56-218	137.2	35.5	—			
ATQ	30-150	68.4	29.5	.73***	—		
HSC ^a	0-15	5.0	3.5	.51***	.58***	—	
CDS-A	23-81	41.5	11.0	.43***	.37***	.44***	—

Note: CDS-D = Children's Depression Scale-Depressed Mood subscale; ATQ = Automatic Thoughts Questionnaire; HSC = Hopelessness Scale for Children; CDS-A = Children's Depression Scale-Anhedonia subscale.

^a*n* = 150.

*** $p < .001$.

Table 3. Correlations Among Affective and Cognitive Characteristics and Suicide-Related Outcomes, and Partial Correlations Correcting for Depressed Mood

Outcome Measure	CDS-D	ATQ		HSC ^a		CDS-A	
	<i>r</i>	<i>r</i>	<i>r_p</i>	<i>r</i>	<i>r_p</i>	<i>r</i>	<i>r_p</i>
SSI total score	.52***	.49***	.19*	.47***	.27***	.42***	.26***
Current suicide attempt	.28***	.30***	.15*	.26***	.15	.31***	.22**
SIS total Score ^b	.54***	.43**	.03	.56***	.38*	.50***	.31

Note: SSI = Scale for Suicidal Ideation; SIS = Suicidal Intent Scale; CDS-D = Children's Depression Scale-Depressed Mood subscale; ATQ = Automatic Thoughts Questionnaire; HSC = Hopelessness Scale for Children; CDS-A = Children's Depression Scale-Anhedonia subscale.

^a*n* = 150. ^b*n* = 39.

p* < .05. *p* < .01. ****p* < .001.

measures of suicidal ideation, the presence of a current suicide attempt, and suicidal intent and also that affective and cognitive factors would be associated with these suicide-related outcome measures after controlling for depressed mood. To test these hypotheses, we first calculated bivariate correlations between each of the affective and cognitive variables and the suicide-related outcome measures. We then calculated partial correlations controlling for depressed mood. The results of these analyses are presented in Table 3.

As hypothesized, each of the affective and cognitive constructs examined was significantly correlated with each of the three suicide-related outcomes before controlling for depressed mood (*r*s [*n* = 39 to 175] = .26 to .56, *ps* < .05). After controlling for depressed mood, the strength of the associations between the measures of negative thoughts, hopelessness, and anhedonia and the suicide measures decreased overall (the only statistically significant decrease was in the relationship between the ATQ and the SSI [Fisher's *z* = 2.78, *p* < .05]). However, the ATQ, HSC, and CDS-A all remained significantly correlated with scores on the SSI, suggesting that the relationships between each of these constructs and suicidal ideation exists independent of the effect of depressed mood. After controlling for depressed mood, the ATQ and the CDS-A remained significantly correlated with the presence of a current suicide attempt, whereas the HSC did not. Conversely, the HSC remained significantly associated with level of suicidal intent, whereas the ATQ and CDS-A did not. Taken together, this pattern of correlations reveals medium-to-large associations between these affective and cognitive constructs and suicide-related outcomes, which are reduced slightly to small to medium associations after controlling for depressed mood. The correlations were similar for all variables when calculated separately for both boys and girls, and there were no significant sex differences, as examined by testing the differences between effect sizes (*r*s) using the Fisher *z* transformation for independent correlation coefficients (Rosenthal & Rosnow, 1991).

Suicide Group Differences on Affective, Cognitive, and Behavioral Factors

The second set of hypotheses stated that scores for negative affect and cognitions and anhedonia would be higher in those reporting suicidal ideation than in non-suicidal children, and these measures, along with suicidal ideation, would be highest in those who made a current suicide attempt. Also, it was expected that current suicide attempters would report a higher frequency of past suicide attempts than the other two groups. These hypotheses were tested using univariate ANOVAs followed by post hoc comparisons to test differences among the three suicide groups. The results of these analyses are presented in Table 4. The ANOVA for each affective, cognitive, and behavioral variable was statistically significant (*ps* < .001), and the effect sizes were in the medium to large range (reported as Cohen's *f* in Table 4). Post hoc comparisons revealed medium to large differences between nonsuicidal and suicidal children (both suicide ideators and attempters) on the CDS-D, ATQ, HSC, and SSI (reported as Cohen's *d* in Table 4).² In contrast, children who made a current suicide attempt differed significantly from all children who did not on the CDS-A and in the number of suicide attempts performed in the 12 months prior to admission. These effect sizes were also in the medium to large range. There was not a significant difference between current suicide attempters and suicide ideators on the SSI.

In terms of sex, the overall ANOVAs for girls and boys all remained statistically significant. In addition, the means and effect sizes (both Cohen's *f* and *d*) remained similar for each comparison examined for both girls and boys, with one exception. There was a large difference between female suicide ideators and attempters on the ATQ (*M* = 72.5, *SD* = 21.6 vs. *M* = 91.1, *SD* = 35.3, respectively), but not for boys (*M* = 77.2, *SD* = 25.4 vs. *M* = 79.1, *SD* = 28.5, respectively).

²The effect sizes (Cohen's *d*) reported are from the post hoc comparison for each variable for the two significantly different groups that had the smaller *t* (i.e., the more conservative effect size).

Table 4. Group Differences on Affective, Cognitive, and Suicide-Related Outcomes

	Nonsuicidal ^a		Suicidal Ideation ^b		Current Suicide Attempt ^c		<i>F</i> (2, 172)	<i>f</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
CDS-D	120.2	28.7 ^d	152.9	32.3 ^e	155.5	35.5 ^e	25.70***	.55	1.24
ATQ	56.9	26.3 ^d	75.6	24.1 ^e	84.9	32.1 ^e	16.68***	.44	.71
HSC ^f	3.8	2.7 ^d	5.8	3.7 ^e	6.7	4.0 ^e	10.48***	.37	.76
CDS-A	38.6	9.0 ^d	41.9	11.4 ^d	48.1	12.9 ^e	13.66***	.40	.51
SSI	6.0	0.0 ^d	19.8	5.2 ^e	19.1	9.4 ^e	147.10***	1.29	5.32
Suicide attempt, past 12 months	.05	.26 ^d	.10	.37 ^d	1.5	2.4 ^e	25.93***	.55	1.22

Note: CDS-D = Children's Depression Scale-Depressed Mood subscale; ATQ = Automatic Thoughts Questionnaire; HSC = Hopelessness Scale for Children; CDS-A = Children's Depression Scale-Anhedonia subscale; SSI = Scale for Suicidal Ideation. *f* = Cohen's *f* (effect size for each *F*); *d* = Cohen's *d* (effect size for comparison between two groups with closest *d* and *e* for each row).

^a*n* = 87. ^b*n* = 49. ^c*n* = 39. ^{d,e}Row values with different subscripts were significantly different in post hoc (Tukey's HSD) comparisons, *p* < .05. ^f*n* = 150.

****p* < .001.

Although neither of these comparisons was statistically significant, the difference produced a large effect size for girls (Cohen's *d* = .70) and a very small effect size for boys (Cohen's *d* = .07).

Discussion

The main goals of this study were to identify factors, above and beyond the effect of depressed mood, associated with suicide-related outcomes in children; and to examine the extent to which these factors differ among children who are nonsuicidal, suicide ideators, and suicide attempters. The main findings were that (a) self-reported depressed mood, negative automatic thoughts, hopelessness about the future, and anhedonia were all significantly associated with suicidal ideation, the presence of a current suicide attempt, and suicidal intent; and (b) after depressed mood was controlled, the strength of the associations between suicide-related outcomes and each affective and cognitive variable was reduced. However, negative automatic thoughts, hopelessness, and anhedonia all remained significantly associated with suicidal ideation, negative automatic thoughts and anhedonia remained significantly associated with the presence of a current suicide attempt, and hopelessness remained associated with suicidal intent; (c) suicidal children were distinguished from nonsuicidal children by higher scores on measures of depressed mood, negative automatic thoughts, and hopelessness; whereas (d) children who reported making a current suicide attempt were distinguished from all children who did not by higher scores on a measure of anhedonia and by a higher number of past suicide attempts, but not by scores on suicidal ideation.

These results suggest that negative automatic thoughts, hopelessness, and anhedonia provide unique information about the severity of suicidal ideation, the

presence of a suicide attempt, and the severity of suicidal intent in psychiatric inpatient children and support the use of these constructs as foci for research and clinical work aimed at identifying and treating potentially suicidal children. Although suicidal children (i.e., both ideators and attempters) reported significantly higher levels of depressed mood, negative automatic thoughts, and hopelessness, the results suggest that children who made a suicide attempt did not do so as a result of more frequent or severe depression, negative cognitions, or suicidal ideation. Instead, children who made a current suicide attempt reported significantly more anhedonia and a higher number of suicide attempts in the previous 12 months, suggesting a qualitative difference (rather than quantitative difference in depressed mood, negative cognitions, or suicidal ideation) between those who actually make a suicide attempt and those who do not.

The relation that emerged between anhedonia and the presence of a current suicide attempt is perhaps the most intriguing finding in this study. Although we did not hypothesize that anhedonia would differ between suicidal ideators and attempters, this result is consistent with work in the adult suicide literature (e.g., Fawcett et al., 1990) and provides preliminary evidence that such a relation also exists in child populations. Despite the consistency of this finding, the actual mechanism through which anhedonia might lead one to engage in suicidal behavior remains unknown. It is possible that a psychological state characterized by anhedonia is more intolerable than the experience of depressed mood and negative cognitions and thus more likely to fuel the motivation to escape one's situation via suicidal behavior. This idea is consistent with previous theories about the function of suicidal behavior and is supported by the data from this study.

The finding that those who made a current suicide attempt reported a higher number of suicide attempts in

the past 12 months than other children is consistent with previous work demonstrating an increased risk for suicide attempts in adolescents with a history of past suicide attempts (e.g., Lewinsohn, Rohde, & Seeley, 1994) and suggests that the repeated performance of suicide attempts also occurs in childhood (cf. Cohen-Sandler et al., 1982). Previous work with young adults has suggested that the performance of a suicide attempt in response to a stressor sensitizes an individual to respond to less severe stressors with similar behaviors (e.g., Joiner & Rudd, 2000). It is possible that a similar mechanism occurs in children, such that the performance of a suicide attempt in response to a stressor makes the performance of future attempts much more likely due to a *lower threshold* for attempting suicide. Nevertheless, the results of this study support the maxim that "the best way to predict the way a person is going to act is to find out how he has acted in the past" (Meehl, 1954, p. 124), indicating that this general rule may be useful in assessing potentially suicidal children.

There were several notable sex differences in this study. First, in children 11 years and older, girls were significantly more likely to make a current suicide attempt than boys. No significant sex difference was observed in children under 11 years. These findings are consistent with previous research demonstrating no sex difference for suicide attempts in prepubertal children (Pfeffer, Plutchik, Mizruchi, & Lipkins, 1986) and with work showing that a sex difference begins to emerge at about 11 years of age (Lewinsohn, Rohde, Seeley, & Baldwin, 2001). Second, this study provides evidence that this sex difference may be related to differences in cognitive style. Girls in this sample reported significantly more frequent negative automatic thoughts than boys; and the difference in the frequency of negative automatic thoughts between suicide ideators and attempters, although not statistically significant, was much larger for girls than for boys. Thus, negative cognitions appear to play a more salient role in the occurrence of suicide attempts in girls than in boys. This interpretation is congruent with previous work showing the presence of cognitive distortions and deficiencies in adolescent, female suicide attempters (i.e., increased problem focused self-statements in response to stressful situations and poor interpersonal problem-solving skills) compared to nonsuicidal adolescent females (Rotheram-Borus, Trautman, Dopkins, & Shrout, 1990) and is also in agreement with the more general finding that adolescent girls report the experience of greater distress following negative life events than adolescent boys (Compas & Wagner, 1991; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Taken together, these findings suggest that the sex difference in level of distress following negative life events is the result of differences in the generation of negative cognitions and that this higher level of stress is more intolerable and thus more likely to lead to a suicide attempt.

Overall, the findings from this study have several important clinical implications. First, including an assessment of negative cognitions and anhedonia may enhance the prediction of suicidal ideation and attempts in children. Second, children reporting a depressed mood and increased levels of negative automatic thoughts and hopelessness should be assessed for the presence of suicidal ideation, and those reporting anhedonia and a past history of suicide attempts should be assessed for the presence of a plan for attempting suicide. In addition, because this study is the first to report on the relations between negative automatic thoughts and anhedonia and suicide-related outcomes in children, these results require replication and the relations described await further elaboration. It is likely that future suicide-related research that includes measures of these constructs will provide fruitful information about the affective and cognitive processes that may lead to suicidal ideation and attempts in children.

Several limitations of this study deserve comment. First, the generality of the results may be restricted. Because this study was completed among child psychiatric inpatients, the affective, cognitive, and behavioral characteristics of suicidal children not identified and admitted to a psychiatric unit may differ from those examined. Second, the relations examined were cross-sectional, and no assertions can be made about the temporal relation of the affective and cognitive characteristics examined and the presence of suicidal ideation and attempts. It is possible that the presence of suicidal ideation and attempts in the participants preceded the occurrence of affective and cognitive changes. Third, data for all of the constructs investigated were obtained via child self-report. This may have limited the validity of the measures and may have inflated correlations among the measures due to method variance. On balance, although an assessment using additional informants (e.g., parents, clinicians) would have provided information from different perspectives, previous studies of adolescent psychiatric inpatients have demonstrated poor interinformant agreement on measures of suicidal ideation and attempts, thus it is not clear that the use of additional informants would have increased the accuracy of the assessment (Prinstein, Nock, Spirito, & Grapentine, 2001). In addition, whereas the reliability of the measure of suicidal intent used in this study has been demonstrated in adolescent inpatient samples, it has not been examined in children ages 6 to 13 years. Therefore, the reliability of the results related to suicidal intent reported in this study is uncertain. A fourth limitation that warrants comment is that most of the data were collected hours and on some occasions days after admission to the hospital. The relatively long period of time between initial suicidal risk and subsequent assessment allows for the possibility that suicidal ideation may have decreased. Indeed, previous investigations have demonstrated that suicidal ideation

often diminishes significantly within 24 hr of making a suicide attempt (Russ, Kashdan, Pollack, & Bajmakovic-Kacila, 1999; van Praag & Plutchik, 1985). This is an important methodological limitation present in most studies of recent suicide ideators and attempters, as it is often very difficult to conduct a comprehensive psychological assessment during an acute suicidal episode. Thus, future studies should continue to explore techniques for overcoming such methodological difficulties.

In summary, this study addressed several limitations of previous research on suicide in children and provided evidence for the relations between several affective, cognitive, and behavioral constructs and different suicide-related outcomes independent of the effect of depressed mood. The results also demonstrated that different affective, cognitive, and behavioral characteristics differed between children who were nonsuicidal versus suicidal and between suicide attempters versus nonattempters. Research on suicide in general, and child suicide in particular, is still at an early stage, and it is likely that future progress will best occur via (a) the continued identification and examination of factors that are useful in the identification and treatment of potentially suicidal individuals; (b) the examination of how these factors differentially relate to and potentially predict *different* suicide-related outcomes (e.g., ideation, attempt, self-mutilation); and (c) the development of theoretical and statistical models that integrate a broad range of potential predictors and examine their relations to distinct suicide-related outcomes.

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