February 2003

Correlates of suicide risk in juvenile detainees and adolescent inpatients

Charles A. Sanislow  
*Yale University School of Medicine*, csanislow@wesleyan.edu

Carlos M. Grilo  
*Yale University School of Medicine*

Dwain C. Fehon  
*Yale University School of Medicine*

Seth R. Axelrod  
*Yale University School of Medicine*

Thomas H. McGlashan  
*Yale University School of Medicine*

Follow this and additional works at: https://wesscholar.wesleyan.edu/div3facpubs

Part of the Behavioral Disciplines and Activities Commons, Behavior and Behavior Mechanisms Commons, Clinical Epidemiology Commons, Clinical Psychology Commons, Mental Disorders Commons, Personality and Social Contexts Commons, Psychiatry Commons, and the Psychological Phenomena and Processes Commons

Recommended Citation


This Article is brought to you for free and open access by the Natural Sciences and Mathematics at WesScholar. It has been accepted for inclusion in Division III Faculty Publications by an authorized administrator of WesScholar. For more information, please contact anelson01@wesleyan.edu, jmlozanowski@wesleyan.edu.
Correlates of Suicide Risk in Juvenile Detainees and Adolescent Inpatients

CHARLES A. SANISLOW, PH.D., CARLOS M. GRILO, PH.D., DWAIN C. FEHON, PSY.D., SETH R. AXELROD, PH.D., AND THOMAS H. McGlashan, M.D.

ABSTRACT

Objective: To compare correlates of risk for suicidal behavior in juvenile detainees with those in another high-risk group, adolescent psychiatric inpatients. Method: Eighty-one adolescents in a short-term juvenile detention center were contrasted with a matched group of 81 adolescent psychiatric inpatients on a clinical assessment battery of established instruments including a measure for risk of suicidal behavior. Results: Juvenile detainees and adolescent psychiatric inpatients reported similar levels of distress on measures of suicide risk, depression, impulsivity, and drug abuse. After controlling for depression, impulsivity and drug abuse remained significantly associated with suicide risk scores in the juvenile detention group, but did not in the psychiatric contrast group. For depressed female inpatients, hopelessness added significantly to the prediction of suicide risk scores. Conclusions: Correlates of risk for suicidal behavior in juvenile detainees may differ from those in other high-risk groups. Results suggest that it may be helpful to examine impulsivity and history of drug abuse when assessing suicide risk for detained adolescents. Further study of juvenile detainees as a separate high-risk group is warranted to better determine the nature and extent of risk. J. Am. Acad. Child Adolesc. Psychiatry, 2003, 42(2):234–240. Key Words: suicide, suicide risk, impulsivity, juvenile detainees, adolescents.

Established risk factors for adolescent suicide are broad and include psychopathology (Andrews and Lewinsohn, 1992; Brent et al., 1986; Shaffer et al., 1996), substance abuse (Brent et al., 1988), depression (Cole, 1989), anti-social behavior (Shafii et al., 1985), and impulsivity, aggression, and violence (Brent et al., 1993; Plutchik et al., 1989). Detained adolescents evidence elevated rates of depression (Alessi et al., 1984a,b), impulsivity, aggression, substance abuse (Milton et al., 1991), and general psychopathology (McManus et al., 1984a,b; Rohde et al., 1997a,b). It follows that reported rates of completed suicide for incarcerated adolescents are as high as 4.6 times greater than the rate in the general adolescent population (Bailey, 1993; Battle et al., 1993; Harris and Lennings, 1993; Memory, 1989). In combination with these factors, the stress of incarceration contributes to suicide risk (American Academy of Child and Adolescent Psychiatry, 2001). An important unanswered question concerns whether risk factors for suicide among detained adolescents are unique compared with those in other, more studied high-risk groups. If so, more study is warranted to develop specialized procedures and methods for suicide prevention in this subpopulation.

In studies of detained juvenile delinquents, two large-scale survey studies have broadly addressed suicide risk. Morris and colleagues (1995) surveyed 1,801 adolescents in 39 juvenile correction facilities in the United States and found that 21.8% had seriously considered suicide, 19.5% had conceived of a plan, 15.5% had made at least one serious attempt, and 8.2% reported being injured during an attempt in the previous 12 months. The highest rates of suicidal behavior were reported by North American Natives (29%), followed by whites (25%), Hispanics (15%), Asian Americans (12%), and African Americans (8%), highlighting the importance of race when considering suicide risk. Overall, females were twice as likely as males to be involved in suicidal behaviors. Among those exhibiting suicidal behaviors, white males
were twice as likely to sustain an injury as a result. Other risk factors for suicidal behaviors included gang membership, drug use, and childhood sexual abuse. Rohde and colleagues (1997b) surveyed 555 adolescents in a county juvenile detention center and found that suicidal behavior in delinquent boys was associated with depression and social impairment, whereas suicidal behavior in girls was associated with impulsivity and instability. Also, not residing with at least one biological parent had predictive value for reports of suicidal behavior by both males and females. These studies demonstrate a wide range of factors associated with heightened risk among detained delinquents, and the breadth of findings makes clinical application of the data difficult.

Several clinically oriented studies indicate depression, not hopelessness, is important in assessing suicide risk in juvenile detainees. Rohde and colleagues (1997a) conducted a diagnostic interview study of a subset of their survey study (Rohde et al., 1997b) subjects and found that suicide attempts were mainly related to the problems of internalizing disorders. Kempton and Forehand (1992) studied suicide attempts among 51 male incarcerated juvenile delinquents between age 11 and 18 using diagnostic interviews and found that hopelessness, conduct disorder, and substance use were not useful in explaining suicide attempts. Harris and Lennings (1993) also reported that hopelessness was not a useful indicator. Cole (1989) studied two separate samples of adolescents—juvenile detainees and public high school students—and found that depression was a more important indicator than hopelessness for suicidal behaviors (including past suicide attempts) in both groups. Cole concluded that prediction of suicidal behaviors in adolescents differed from that in adults, but did not address whether suicide risk factors for juvenile detainees might be unique. Overall, clinical studies of suicide in juvenile detainees point to depression as a consistent risk factor, but other potential risk factors are less clear.

We note two primary limitations in the literature on suicide risk for juvenile detainees. First, there is no consistent definition of “juvenile detainee.” Various types of detention centers have been studied, and the setting is not always clearly described. Subjects often vary widely in age. Second, although it is plausible that juvenile detainees exhibit a unique risk profile for suicidal behaviors, none of the studies to date have contrasted detainees with a nondetention control group from another high-risk population.

Another issue concerns the possibility of elevated rates of psychiatric disorders for contemporary juvenile detainees. One recent study reported high rates of affective disorder (42%) in such a center (Piszka et al., 2000), while another documented the juvenile justice system as a contact point for youths who later become suicidal (Gray et al., 2002). Preadjudicated detainees held in short-term facilities may pose greater risk than those in longer-term facilities because they exhibit a broader spectrum of disruptive behavior not just limited to more serious criminal offenses. For instance, many youngsters in nonadjudicated facilities have been detained because of family-related problems brought to the court through mental health and social service agencies. Furthermore, suicide prevention programs in short-term detention facilities face the difficulty of a high rate of turnover of the youths, lessening staff familiarity with children admitted. By definition, many adolescents in short-term facilities are in an acute situation. Juvenile detainees in these facilities are an understudied high-risk subgroup, and more knowledge would inform specialized prevention efforts (Shaffer et al., 1988).

In this study, correlates of self-reported suicide risk were examined using data from a computerized clinical assessment battery used in a short-term juvenile detention center mental health program. Examination of suicide risk, known to fluctuate considerably over time and temporally associated with stress or changes, requires attention to controlling for such phenomena. To provide a context, a comparison group of adolescents admitted to an acute psychiatric hospital was selected. Thus we examined cross-sectionally a number of correlates hypothesized to be associated with suicide risk in the detention group and contrasted the results with the matched group selected from the psychiatric hospital database. Because assessment methods for each population were nearly identical (both used the same computerized assessment; both were assessed 1 to 4 days after admission; data were obtained from both settings during an overlapping time period), a number of potential confounds characteristic of recruiting subjects from different facilities were eliminated (Allison, 1993) including recruitment and sampling biases (du Fort et al., 1993).

**METHOD**

Subjects

Subjects were 162 adolescents in two study groups: 81 adolescents were from a juvenile detention center and a matched group of 81 adolescents were from an inpatient psychiatric hospital.
Juvenile Detention (JD) Study Group. Eighty-one subjects aged 13 to 16 years were assessed in a short-term, urban juvenile detention facility where youngsters were held pending adjudication. Modal length of stay was 2 weeks (juveniles with complicated legal cases or other disposition-related problems can be held for a longer period). Legal charges for this group ranged from status offenses (e.g., violating court-ordered curfew or truancy) to more serious charges including drug-related charges, automobile theft, and assault charges stemming from fights with peers or resisting arrest. Subjects were selected without knowledge of clinical status from the JD population for the assessment battery. Assembling subjects were screened for adequate reading ability to understand and complete the measures. Five subjects were excluded, two for not assembling and three because of questionable reading level (confirmed by school records). Females were slightly oversampled, ensuring adequate representation for gender. The resulting study group included 44 males (54.3%) and 37 females (45.7%). Chi-square analysis indicated the association between race and gender was not significant ($\chi^2 = 2.82$, NS). The racial breakdown (26 white, 26 African American, 27 Hispanic, and 2 "other") approximated statewide preadjudication admission rates ($\chi^2 = 2.10$, NS).

Psychiatric Contrast (PC) Study Group. For the PC study group, 81 subjects, selected from the hospital database composed of a nearly consecutive sample of adolescent admissions obtained from the same time period as the detention assessments, were matched with the JD study group on race and gender. Pairs of subjects were aged within 1 year of each other. The psychiatric inpatients completed the self-report battery of psychological and behavioral measures 1 to 4 days after admission. The selection procedure involved exhausting minorities (i.e., African American and Hispanic) in the study age range from the hospital sample. White subjects were drawn using a random-number generator selecting without replacement. Our goal was to select a high-risk group other than juvenile detainees for comparison purposes; to ensure the selected study group adequately represented the white patients in the hospital population, the resulting PC study group means for each measure were inspected to ensure that each fell within the margin of ± 1 SE of the population mean of the hospital database. A follow-up check on study measures comparing the matched whites with the complete white sample revealed no significant differences. The same algorithm was applied to each of the subjects in the "other" race category.

Overall, the PC study group was diagnostically heterogeneous. Like the JD study group, adolescents served by the hospital included a substantial portion of impoverished inner-city residents. Most frequently assigned DSM-IV diagnoses were major depressive disorder (49.4%), drug use disorders (38.8%), dysthymic disorder (30.6%), oppositional defiant disorder (25.9%), conduct disorder (24.7%), and alcohol use disorders (14.1%). Many subjects had more than two diagnoses (54.1%), and most had more than one (85.9%). These diagnoses, obtained by consensus of a multidisciplinary treatment team of experienced clinicians at the time of discharge, are provided for descriptive purposes and illustrate the severity of the psychiatric disturbance among this group.

Procedure
Subjects from both the JD and PC study groups completed a battery of self-report measures (described below) between 1 and 4 days after admission as part of their clinical evaluation. Time required to complete the battery was 20 to 30 minutes. All measures were administered and scored by computer under the supervision of a trained examiner. Computerized administration of psychological measures has been found to compare favorably with pen-and-pencil methods (Wilson et al., 1985) and may be particularly useful when assessing sensitive topics such as suicidality (Erdman et al., 1987; Fowler, 1985).

Human Subjects Concerns. The psychiatric inpatients and juvenile detainees provided assent for completing the measures, and their parents/guardians provided written consent for overall mental health evaluations that included these measures and consent for medical treatment. Human subjects approval was obtained for a chart review study of the JD subjects and PC contrast group.

Measures
The Suicide Risk Scale (SRS) (Plutchik et al., 1989) is a 15-item true/false self-report measure used to assess suicide risk. Items query current suicidal feelings, past suicidal behavior, and other items associated with suicide risk. The SRS has good internal reliability, with a coefficient of .84 in adults and .75 in adolescents (Grosz et al., 1994), as well as good sensitivity and specificity (Plutchik and Van Praag, 1989; Plutchik et al., 1989). The SRS has been cross-validated with other samples including adult inpatients, outpatients, college students, and an adult forensic sample (Apter et al., 1991). It discriminates patients who have attempted suicide and those who have not in adults (Plutchik et al., 1989) and adolescents (Grosz et al., 1994). Studies have found that SRS scores average roughly 4 for non-suicidal patients, 6 for patients with one suicide attempt, and 8 for patients with multiple attempts (Plutchik and Van Praag, 1989; Plutchik et al., 1989). The SRS thus provides a good proxy to study suicide risk as indicated by past suicidal behavior and other characteristics associated with present suicide risk. Owing to the difficulties of studying suicide (O'Carroll et al., 1996), the SRS was a logical choice for the dependent variable to approximate suicide risk in a standardized, replicable manner.

The Beck Depression Inventory-21-item version (BDI) (Beck and Steer, 1987; Beck et al., 1979) is a well-established, widely used inventory of the cognitive, affective, motivation, and somatic symptoms of depression. It has been researched extensively with adolescents (Steer and Beck, 1988) and shown to have excellent psychometric properties with adolescent inpatients (Ambrosini et al., 1991; Steer and Beck, 1988; Strober et al., 1981). Strober and colleagues (1981) reported an internal consistency of 0.79, a 0.67 correlation with clinical ratings of depression, and a 5-day test-retest reliability of 0.69 for a sample of adolescent inpatients. The BDI was an independent variable.

The Hopelessness Scale for Children (HSC) (Kazdin et al., 1986) is a 17-item true/false scale for children and adolescents that measures negative expectations about the future. It has been used with adolescents and demonstrated good psychometric properties (Kazdin et al., 1986; Spirito et al., 1988). In patient groups similar to our PC study group, it has been shown to have excellent internal consistency ($\alpha = 0.97$), adequate test-retest reliability (0.52 over a 6-week period), and concurrent validity with independent assessments of suicidality (Kazdin et al., 1983, 1986). The HSC was an independent variable.

The Impulsivity Control Scale (ICS) (Plutchik and Van Praag, 1989) is a 15-item self-report scale designed to assess impulsivity that is independent of aggressive behavior; items are answered on a 3-point frequency scale. With adolescents, it has good internal reliability and correlates well with other measures of suicide and violence risk (Grosz et al., 1994), and the measure performs similarly well with adults (Plutchik and Van Praag, 1989). The ICS was an independent variable.

The Drug Abuse Screening Test for Adolescents (DAST-A) (Martino et al., 2000) is a more recently developed 27-item self-report screening instrument that directly queries adolescents about any adverse consequences they may have experienced secondary to drug use. Because sequelae of drug abuse may overlap with psychiatric conditions, DAST-A items incorporate language which explicitly links adverse consequences of drug use to distinguish adolescents with drug-
related problems from those whose problems emanate primarily from psychiatric concerns (Kirisci et al., 1995). The DAST-A has demonstrated good internal consistency, concurrent validity, high 1-week test-rest reliability, and a unidimensional factor structure (Martino et al., 2000). The DAST-A was an independent variable.

RESULTS

Table 1 shows group means and standard deviations of the study measures for the two study groups and results from paired t tests. Both groups evidenced clinically significant levels of psychological distress. The JD study group reported trends toward less hopelessness (borderline significant) and risk for suicidal behavior (not significant) at the p < .05 level. For differences by demography, none were found on age and race, and the only statistically significant gender difference observed was for the PC study group, in which girls scored higher than boys on the BDI (mean 21.2 [SD = 12.8] versus 13.9 [SD = 10.2]; t80 = -2.836, p < .01).

Table 2 shows correlations and partial correlations of suicide risk controlling for depression for both study groups. For the JD study group, correlations of the HSC, ICS, and DAST-A with the SRS were all significant. Because a strong relation between suicidality and depression has been demonstrated (Apter et al., 1995; Schwartz et al., 2000), associations between SRS and the HSC, ICS, and DAST-A were more closely examined. When three variables are intercorrelated, a partial correlation can be used to remove the effects of one variable to assess better the relationship between the remaining two variables. With depressed mood “partialed out” by removing variance in suicide risk associated with depressed mood (see srBDI column of Table 2), ICS and DAST-A remained significantly correlated with SRS, but HSC did not. For the PC study group, the BDI, HSC, and DAST-A also correlated significantly with SRS. However, once depressed mood was partialed out, none remained significant (each partial correlation remained positive and HSC approached significance, p = .094).

To determine whether correlates of suicide risk were unique to juvenile detainees, we constructed separate multiple regression models for each study group. SRS was the dependent variable, and the primary independent variables were BDI, HSC, ICS, and DAST-A. To test unique associations with SRS, independent variables were entered in “steps” (either alone or in varying combinations) using “forced entry” as described below. For each study group, two models were developed. First, primary independent variables were included (BDI, HSC, ICS, and DAST-A). Because of the potential of gender to interact with suicide risk (Shaffer, 1988; Shaffer et al., 1988), a second model for each group tested gender and its interaction with depression and hopelessness on suicide risk. For each group, BDI was entered in the first step (for all regression analyses, the BDI suicide item, item 9, was omitted to capture the extent that depression indicators other than suicidal ideation are associated with risk for suicidal behaviors). In a series of follow-up steps, each of the remaining variables was entered by itself (in addition to BDI) to test respective unique contributions to the variance explained. Remaining independent variables (HSC, ICS, and DAST-A) were then entered collectively in a subsequent step to test the full model. For models testing gender, gender was entered in step 1, followed by BDI in step 2, and HSC, ICS, and DAST-A in step 3. The interaction between gender and BDI was entered in step 4, gender and HSC in step 5, and the three-way interaction in the final step. Results are shown in Table 3.

In the JD study group, results of the first model were as follows: 59% of the SRS variance was explained by the

---

### TABLE 1

<table>
<thead>
<tr>
<th>Scale</th>
<th>Detention (n = 81)</th>
<th>Psychiatric (n = 81)</th>
<th>t Value (df = 80)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide Risk Scale</td>
<td>4.8 (3.6)</td>
<td>5.8 (3.6)</td>
<td>1.819</td>
<td>.073</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>16.4 (11.0)</td>
<td>17.2 (12.0)</td>
<td>0.436</td>
<td>.664</td>
</tr>
<tr>
<td>Hopelessness Scale for Children</td>
<td>4.7 (3.5)</td>
<td>5.8 (4.0)</td>
<td>1.987</td>
<td>.050</td>
</tr>
<tr>
<td>Impulsivity Control Scale</td>
<td>16.6 (6.1)</td>
<td>17.9 (6.7)</td>
<td>1.300</td>
<td>.197</td>
</tr>
<tr>
<td>Drug Abuse Screening Test-A</td>
<td>5.5 (5.7)</td>
<td>5.9 (5.6)</td>
<td>0.516</td>
<td>.608</td>
</tr>
</tbody>
</table>

---

### TABLE 2

<table>
<thead>
<tr>
<th>Scale</th>
<th>Detention (n = 81)</th>
<th>Psychiatric (n = 81)</th>
<th>r</th>
<th>r_SrBDI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI</td>
<td>0.78***</td>
<td>0.70***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSC</td>
<td>0.60***</td>
<td>0.50***</td>
<td>0.12</td>
<td></td>
<td>0.19</td>
</tr>
<tr>
<td>ICS</td>
<td>0.42***</td>
<td>0.21</td>
<td>0.27*</td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td>DAST-A</td>
<td>0.38***</td>
<td>0.15</td>
<td>0.25*</td>
<td></td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note: BDI = Beck Depression Inventory; HSC = Hopelessness Scale for Children; ICS = Impulsivity Control Scale; DAST-A = Drug Abuse Screening Test for Adolescents.

* p < .05; *** p < .001.
### TABLE 3
Variance Accounted for ($R^2$) in Suicide Risk

<table>
<thead>
<tr>
<th>Model</th>
<th>Step</th>
<th>Variables Entered</th>
<th>$R^2$</th>
<th>$df$</th>
<th>$F$</th>
<th>$F$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detention</td>
<td></td>
<td></td>
<td>[Image 0x0 to 574x777]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>1</td>
<td>BDI</td>
<td>0.60</td>
<td>(1,79)</td>
<td></td>
<td>117.82***</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ HSC</td>
<td>0.61</td>
<td>(1,78)</td>
<td></td>
<td>1.34</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ ICS</td>
<td>0.63</td>
<td>(1,78)</td>
<td></td>
<td>5.74*</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ DAST-A</td>
<td>0.63</td>
<td>(1,78)</td>
<td></td>
<td>5.58*</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ HSC, ICS, DAST-A</td>
<td>0.65</td>
<td>(3,76)</td>
<td></td>
<td>3.33*</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ BDI</td>
<td>0.61</td>
<td>(1,78)</td>
<td></td>
<td>121.51***</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>+ HSC, ICS, DAST-A</td>
<td>0.66</td>
<td>(3,75)</td>
<td></td>
<td>3.50*</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>+ gender × BDI</td>
<td>0.66</td>
<td>(1,74)</td>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>+ gender × HSC</td>
<td>0.66</td>
<td>(1,73)</td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>+ gender × BDI × HSC</td>
<td>0.67</td>
<td>(1,72)</td>
<td></td>
<td>1.81</td>
</tr>
<tr>
<td>II.</td>
<td>1</td>
<td>Gender</td>
<td>0.01</td>
<td>(1,79)</td>
<td></td>
<td>1.05</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+ BDI</td>
<td>0.61</td>
<td>(1,78)</td>
<td></td>
<td>121.51***</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>+ HSC, ICS, DAST-A</td>
<td>0.66</td>
<td>(3,75)</td>
<td></td>
<td>3.50*</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>+ gender × BDI</td>
<td>0.66</td>
<td>(1,74)</td>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>+ gender × HSC</td>
<td>0.66</td>
<td>(1,73)</td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>+ gender × BDI × HSC</td>
<td>0.67</td>
<td>(1,72)</td>
<td></td>
<td>1.81</td>
</tr>
</tbody>
</table>

Psychediatric

| I. | 1 | BDI | 0.47 | (1,79) | | 69.74*** |
| | 2 | + HSC | 0.49 | (1,78) | | 3.46 |
| | 2 | + ICS | 0.47 | (1,78) | | 0.03 |
| | 2 | + DAST-A | 0.47 | (1,78) | | 0.75 |
| | 2 | + HSC, ICS, DAST-A | 0.50 | (3,76) | | 1.81 |
| | 2 | + BDI | 0.47 | (1,78) | | 64.32*** |
| | 3 | + HSC, ICS, DAST-A | 0.50 | (3,75) | | 1.73 |
| | 4 | + gender × BDI | 0.51 | (1,74) | | 0.06 |
| | 5 | + gender × HSC | 0.53 | (1,73) | | 4.08* |
| | 6 | + gender × BDI × HSC | 0.53 | (1,72) | | 0.11 |

Note: $n = 81$. BDI = Beck Depression Inventory; HSC = Hopelessness Scale for Children; ICS = Impulsivity Control Scale; DAST-A = Drug Abuse Screening Test for Adolescents.

* BDI item 9 (suicidal ideation) is removed.

* $p < .05$; *** $p < .001$.

BDI in step 1 ($p < .001$). For the follow-up step tests, adding HSC to depression did not significantly increase the variance explained, whereas the addition of either ICS or DAST-A did ($p < .05$ for each). The collective addition of HSC, ICS, and DAST-A to the BDI added significantly to the model, explaining a total of 65% of the variance ($F_{4,76} = 3.33, p < .001$). For the second model to test gender differences, gender by itself did not explain a significant portion of variance (<1%), and none of the gender interactions was significant.

For the PC study group, results of the first model were as follows. Overall, BDI accounted for 47% of the variance ($F_{1,79} = 69.74, p < .001$). In contrast to the JD study group, none of the remaining independent variables entered alone or collectively added significantly to the model. However, tests of the interactions for gender with hopelessness and depression revealed that there was a significant interaction between gender and hopelessness, but only after the effects of the depression and gender interaction were accounted for (the three-way interaction of gender, depression, and hopelessness was not significant). This result suggested high levels of hopelessness explained a significant portion of variance for suicide risk for females scoring high on depression.

### DISCUSSION
This study examined factors associated with suicide risk including depressed mood, hopelessness, impulsivity, and drug abuse for adolescents in a short-term juvenile detention center using cross-sectional data from well-established, psychometrically sound measures. Associations of risk factors were also examined in a study group of psychiatric adolescent inpatients matched to the JD study group by gender, race, and age. Juvenile detainees reported levels of psychological distress similar to those of severely disturbed adolescents hospitalized on an acute psychiatric inpatient unit. After controlling for depressed mood, impulsivity and drug abuse added significantly to the variance explained for suicide risk among the juvenile...
nile detainees, but not for the adolescent psychiatric inpatients. The distinct factors associated with suicide risk for juvenile detainees may inform the development of suicide risk programs for this high-risk group.

The high degree of psychological distress in the detention youngsters is noteworthy. Although on average the PC study group scores were slightly higher than those of the JD study group, these differences were not significant (a few measures bordered on significance). Thus it appears that both groups were similar in level of depressed mood, hopelessness, impulsivity, drug abuse, and suicide risk. The similarity between the two study groups was ideal for comparing the specificity of risk factors for the two populations.

A large portion of variance in suicide risk as measured by the SRS was explained for each group. For the JD study group, 65% of the variance was explained by the BDI, HSC, ICS, and DAST-A. In the PC contrast group, 50% of the variance was explained by these variables. The sequence of regression equations to examine the associations of variables with suicide risk for the two groups indicated that impulsivity and drug abuse explained a significant portion of variance not explained by the level of depressed mood for suicide risk for the JD study group, but not for the PC contrast group. It is important to note that substance use disorders are a known risk factor for suicide in adolescents, including single-episode substance abuse (King et al., 2001), suggesting that subclinical episodes are relevant. In the case of detained adolescents, it would be helpful to examine thresholds more closely in this regard.

For both groups, hopelessness did not remain associated with suicide risk. This is consistent with reports that depression, not hopelessness, is an important predictor of suicide risk for adolescents (Cole, 1989; Harris and Lenning, 1993; Kempton and Forehand, 1992; Miller et al., 1982). In the PC contrast group, however, examination of a gender-by-hopelessness interaction suggested that hopelessness might matter for females who report high levels depression, a result consistent with prior studies (Shaffer, 1988; Shaffer et al., 1988).

Limitations

The primary limitation of this study is that its cross-sectional design limits what we can say about future suicidal behavior. These results indicating unique associations for juvenile detainees, however, suggest that it may be worthwhile to pursue prospective study. Another limitation is our exclusive reliance on self-report measures to identify suicide risk. In general, suicide is a very difficult phenomenon to study because the low base rate of the phenomenon makes it difficult and costly to gather samples large enough for adequate statistical power. A viable alternative, then, is to study suicide risk using a well-established and psychometrically sound measure used widely with similar patient groups (Grosz et al., 1994; Plutchik et al., 1989). Such a standardized approach allows the potential for replication in other samples (O’Carroll et al., 1996).

The selection procedures for the JD study group may have been problematic for a couple of reasons. Assessing consecutively admitted detainees would have been ideal to allow for generalization of the base rates of psychological distress. Hidden bias may also have been introduced with the matching procedure. However, estimates of prevalence rates and average levels of psychological distress in the population of juvenile detainees were not primary goals. As noted, the psychological distress found in the juvenile detainees in this study was not out of line with other reports indicating substantial disturbance for juvenile detainees in short-term facilities (Pliszka et al., 2000). A more important point concerns the diagnostic composition of our JD study group. It may be that the impulsivity and drug abuse risk factors are proxies for a higher rate of externalizing disorders not found in the PC contrast group where internalizing disorders might be most relevant to suicide risk. It will be helpful for future studies to include diagnostic interviews.

The narrow age range of subjects included in our study groups is both a strength and limitation. Our findings may not be generalizable to other age groups. Conversely, a narrow age range is desirable because substantial developmental changes typify adolescence. Exposure to street drugs is one example where differences might occur over a brief time period in chronological age, perhaps as short as 1 year. However, analyses to examine for possible age effects including testing for differences in drug abuse between the two groups while controlling for age revealed no differences.

Clinical Significance

Our findings suggest that juvenile detainees report levels of psychological distress not unlike those observed in adolescent psychiatric inpatients. However, it appears that important differences may exist in the patterns of these correlates with self-reported suicide risk. The interplay of associated psychopathological factors such as high levels of depression and hopelessness, along with the acute situational stress of incarceration, may help to explain the elevated scores of risk for suicide that we found in our JD study.
group. These preliminary findings suggest it may be worthwhile to assess risk factors for suicide other than depressed mood including substance abuse and impulsivity in juvenile detainees. The factors that we identified also help to conceptualize the clinical nature of suicide risk in juvenile detainees. One might speculate that youngsters who are detained no longer have an outlet for their distress via their routine, impulsive pathways, or by attempting to cope using illicit substances. Risk for suicide may increase when these outlets are thwarted in the acute stages of incarceration.

REFERENCES


