The Relationship Between Posttraumatic Stress Symptomatology and Suicidal Behavior in School-Based Adolescents

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This study investigated the relationship between posttraumatic stress disorder (PTSD) symptomatology and suicidal behavior, specifically suicidal ideation and suicide attempt history, while controlling for depression and gender in 106 adolescents in an urban high school. Participants completed self-report measures of the Adolescent Psychopathology Scales-Posttraumatic Stress Disorder Subscale (APS-PTS), the APS-Suicide Attempt History (APS-SAH), the Suicidal Ideation Questionnaire-Junior (SIQ-JR), and the Reynolds Adolescent Depression Scale (RADS). Analyses were conducted using a hierarchical multiple regression design to account for the relationship between PTSD symptomatology and depression. Regression results showed that after controlling for depression and gender, PTSD symptomatology was significantly related to suicidal ideation and showed a trend toward suicide attempt history. In addition, adolescents with high levels of PTSD symptomatology were more likely than peers with "average" levels of PTSD symptomatology to be currently thinking about suicide and to have made a past suicide attempt. These findings show that PTSD symptomatology has a unique relationship to adolescent suicidal behavior that cannot be explained by depression or gender. The importance of these results and their implications for future research are discussed.

Adolescent suicide and suicidal behavior continue to be major concerns for mental health professionals, parents, and adolescents themselves. Adolescent suicide is a leading cause of death in youth aged 15–19, with a base rate of approximately 11/100,000 (Hammond, 1998). According to the Center for Disease Control and Prevention (CDC, 1995), the adolescent suicide rate (ages 15–19) increased 28.3% from 1980 to 1992. Although suicide itself remains relatively low in frequency, research has shown that suicidal behaviors, such as suicide attempts and suicidal ideation, are relatively common in adolescents (CDC, 1995; Garrison, McKeown, Valois, & Vincent, 1993). The incidence rate of suicide attempts has been reported at approximately 7.5% (Garrison et al., 1993) and suicidal ideation at 11–13% (Reynolds & Mazza, 1994). The potential lethal nature of these behaviors and their frequency supports the need for examining related risk factors that may precipitate or exacerbate adoles-

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cents' suicidal cognitions and behaviors. Such research is important for identifying related risk factors and increasing our understanding of adolescent suicidal behaviors.

Research studies examining suicidal behavior in adolescents have identified psychopathology as an important factor commonly found among youth engaging in self-destructive behaviors (Brent et al., 1988, 1994; Hoberman & Garfinkel, 1988; Kashani, Goddard, & Reid, 1989; Lewinsohn, Rohde, & Seeley, 1993; Marttunen, Aro, Henriksson, & Lonnqvist, 1991, 1994; Runeson, 1989; Shafii, Steltz-Lenarsky, Derrick, Beckner, & Whittinghill, 1988). Numerous types of psychopathology have been identified in relation to adolescent suicidal behavior including depressive disorders, anxiety, substance abuse, and conduct disorder (Brent et al., 1993a, 1994; Hoberman & Garfinkel, 1988; Kashani et al., 1989; Lewinsohn et al., 1993; Marttunen et al., 1991, 1994; Shafii et al., 1988). Shafii et al. (1988), in conducting psychological autopsies, reported that 95% of adolescent suicide completers met the criteria for at least one psychiatric disorder before their death. Similarly, Brent et al. (1993a) reported that 32 of 37 (86.5%) adolescent suicide attempters were diagnosed with an affective disorder.

Although these studies examined a wide array of disorders, there are some disorders that have received minimal investigation yet may be related to adolescents suicidal behavior, such as posttraumatic stress disorder (PTSD) (Brent et al., 1993c, 1995; Mazza & Reynolds, 1999). One reason for the lack of research in this area may be the strong focus on affective disorders in relation to adolescent suicidal behavior (Brent et al., 1988, 1993b, 1994; Lewinsohn et al., 1993; Shafii et al., 1988). Shafii and colleagues (1988) reported that of the 21 adolescent suicide victims, 16 (76%) met the criteria for depression; PTSD was not examined. Similarly, Brent and colleagues (1988) compared the psychopathology of 27 adolescent suicide completers to 56 suicidal inpatients. They reported that 63% of the completers and 82%

of the inpatients had an affective disorder; again, PTSD was not examined. The assessment of PTSD symptomatology may be difficult using psychological autopsy methodology, thereby limiting research to suicide attempters and ideators.

The comorbidity of PTSD and depression may be a second reason for the lack of research (Brent et al., 1995; Pynoos, 1994). Brent et al. (1995) reported that of eight students who developed PTSD after being exposed to a peer suicide, five (62.5%) had concurrent major depression, and that all five students developed depression simultaneously with the onset of PTSD. Sack, McSherry, Clarke, Kinney, Seeley, and Lewinsohn (1994), in studying Cambodian refugees from the Pol Pot Regime, reported that depression and PTSD frequently cooccurred. Further research investigating the relationship between PTSD and depression and their effects on other mental health difficulties is needed.

The symptomatology comprising PTSD and the unique characteristics that distinguish it from depression and other psychiatric disorders deserves further discussion. One component of PTSD is an identifiable precipitating factor either witnessed, experienced, or both: a feature not necessary for depression. This event may cause an intense physiological reaction and feelings of intense fear, helplessness, or horror (American Psychiatric Association [APA], 1994; Bremner, Davis, Southwick, Krystal, & Charney, 1994; Pynoos et al., 1987). Reexperiencing the traumatic event through nightmares, recurrent images, flashbacks, and intrusive thoughts sets PTSD apart from other psychiatric disorders (Amaya-Jackson & March, 1995). It is the reexperiencing of the event and an inability to control the recursiveness behaviors that may lead to feelings of helplessness and hopelessness and, in turn, depression or other psychopathology, including suicidal behavior. In addition, the persistent avoidance of people, places, activities, and conversations that relate to the trauma or traumatic event may result in feelings of loneliness and

isolation. Thus, the impact of a traumatic event for children and adolescents may result in adversities in several different areas, including mental health and cognitive functioning (Garbarino, 1995; Garbarino, Dubrow, Kostelny, & Pardo, 1992; Pynoos & Nader, 1988; Terr, 1983).

Research examining PTSD and its symptomatology in relation to adolescent mental health has primarily focused on chronic and acute exposure to violence (Fitzpatrick & Boldizar, 1993; Pynoos et al., 1987; Pynoos & Nader, 1988; Realmuto, Masten, Carde, Hubbard, Groteluschen, & Chhun, 1992; Sack et al., 1994; Saigh, 1991; Singer, Anglin, Song, & Lunghofer, 1995; Terr, 1981, 1983). Fitzpatrick and Boldizar, in a study of 221 inner city youth who were chronically exposed to violence, reported that 54 (27.1%) met the DSM-III-R diagnostic criteria for PTSD. Singer and colleagues, in a survey of 3,735 high school students, reported that PTSD was a significant predictor of psychological dysfunction experienced by adolescents. Given that approximately 75–93% of adolescents have been reportedly exposed to violence (Fitzpatrick & Boldizar, 1993; Gladstein, Rusonis, & Heald, 1992; Mazza & Reynolds, 1998; Richters & Martinez, 1993; Shakoor & Chalmers, 1991), further research investigating the role of PTSD specific to adolescent suicidal behavior is warranted.

The purpose of this study was to examine the relationship between PTSD symptomatology and suicidal behavior, specifically suicidal ideation and suicide attempt history, while controlling for depression severity and gender in a sample of high school students. This study was designed to account for the relationship between PTSD and depression to examine the unique contribution of PTSD symptomatology to suicidal ideation and past attempts. In addition, this study compared suicidal behaviors between two groups of adolescents, those with high levels of PTSD symptomatology and those with normal or "average" levels. PTSD symptomatology was measured by the Adolescent Psychopathol-

ogy Scale-Posttraumatic Stress Disorder Subscale (Reynolds, 1998a), a 12-item measure that assesses DSM-IV symptomatology associated with PTSD.

METHODS

Participants

The participants were 106 high school adolescents enrolled in Grades 9–12 in a public high school in a large urban city in the Pacific Northwest. The high school is located in an ethnically diverse community that approximates the ethnicity and socioeconomic status (SES) of the population within the geographic region. The sample consisted of 54 females and 52 males with a mean age of 15.63 ($SD = 1.16$). The ethnicity of the sample was 59.4% Caucasian, 15.1% Asian American, 14.2% African American, 5.7% Hispanic American, 2.8% Native American, and 2.8% other. The SES was diverse across the sample with a mean of 4.1 ($SD = 2.2$) using Hollinghead's (1975) 9-point scale for socioeconomic status.

Instruments

Adolescent Psychopathology Scale-Posttraumatic Stress Disorder Subscale (APS-PTS; Reynolds, 1998a). The APS is a self-report measure used to assess internalizing and externalizing disorder symptomatology in adolescents. The APS-PTS subscale is 1 of 20 clinical disorder scales on the APS, along with 5 personality disorder scales and 11 psychosocial problem content scales. The APS-PTS subscale consists of 12 items that evaluate specific symptomatology associated with the DSM-IV (APA, 1994). Items on the APS-PTS assess symptomatology within the past 6 months that includes experience of a traumatic event, feelings of detachment, difficulty concentrating, sleep problems, and recurring thoughts about the event. Two of the 12 items use a true/false format, whereas the remaining 10 items use a 3-point scale from

1 ("never or almost never") to 3 ("nearly all the time").

The APS was standardized on two adolescent populations: 506 clinical adolescents and 1,827 school-based adolescents (Reynolds, 1998b). The internal consistency reliability based on the APS-PTS school-based standardization sample was .84. The test–retest reliability coefficient for the APS-PTS was .81 for a 2-week period (Reynolds, 1998b).

Adolescent Psychopathology Scale-Suicide Attempt History (APS-SAH; Reynolds, 1998a). Questions from the APS demographic sheet that examine adolescents' suicide attempt history were inserted into the Suicidal Ideation Questionnaire-Junior (SIQ-JR). The questions pertaining to suicide attempt history included asking adolescents if they have made a past attempt, and if so, how many months ago, the method of attempt, and if they went to the hospital. This information was used to determine if adolescents had made a previous suicide attempt.

Suicidal Ideation Questionnaire-Junior (SIQ-JR; Reynolds, 1987a). The SIQ-JR is a 15-item self-report questionnaire used to assess current suicidal thoughts. The SIQ-JR was specifically developed for young adolescents in Grades 7–9. The SIQ-JR can be administered in group or individual settings and takes approximately 7–8 minutes to complete. Items on the SIQ-JR are scored based on a 7-point Likert-type scale, ranging from 0 ("I never had this thought") to 6 ("almost every day"). Items examine specific domains of suicidal ideation, including morbid ideation, wishes of being dead, desires and plans for a suicide, and perceptions of others if dead. To examine current ideation, SIQ-JR items assess the frequency of specific suicidal thoughts during the past month (Reynolds, 1988).

The psychometric properties of the SIQ-JR are based on a standardization sample of 1,290 school-based adolescents in Grades 7–9. The internal consistency reliability coefficient for the SIQ-JR was .94. Validity evidence has been demonstrated through construct validity as well as clinical

validity (Reynolds, 1988). Construct validity in the form of convergent validity showed moderate to strong correlation, ranging from .54 to .66, with related affective constructs of depression and anxiety. The correlation coefficient between the SIQ-JR and a clinical interview measure assessing adolescent suicidal behavior was reported at .68 (Reynolds, 1990). The SIQ-JR has been used in various clinical settings and with adolescents of varying ages (e.g., King, Hill, Naylor, Evans, & Shain, 1993; King, Hovey, Brand, Wilson, & Ghaziuddin, 1997; King, Radpour, Naylor, Segal, & Jouriles, 1995). The SIQ-JR was selected for this study because of the short number of items and the length of the self-report battery.

Reynolds Adolescent Depression Scale (RADS; Reynolds, 1986a). The RADS is a self-report measure designed for adolescents to assess depression severity. The RADS consists of 30 items that are scored on a 4-point Likert-type scale, ranging from 1 ("almost never") to 4 ("most of the time"). The items on the RADS reflect the symptom criteria from the DSM-III (APA, 1980) for major depression and dysthymic disorder as well as symptoms found in unipolar depression (Reynolds, 1987b).

The standardization sample for the RADS was 2,460 school-based adolescents from Grades 7–12. The psychometric characteristics of the RADS have been well documented (Reynolds, 1987b). The internal consistency reliability coefficient for the RADS was .92 and the test–retest reliability coefficient for a 6-week interval was reported at .80 (Reynolds, 1987b).Concurrent validity was examined comparing the RADS to the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960), with a correlation coefficient of .83. Construct validity was examined comparing the RADS to other related constructs such as hopelessness, suicidal ideation, and anxiety, with correlation coefficients ranging from .50 to .80. The RADS also has been used in numerous research studies with school-based and clinical populations (e.g., Adams & Adams, 1993; Brand, King, Olson,

Ghaziuddin, & Naylor, 1996; Carey, Finch, & Carey, 1991; King et al., 1995; Shain, Naylor, & Alessi, 1990).

Procedures

Before data collection, all parents of students enrolled at the high school were mailed parental consent forms. A total of 523 consent forms were mailed, of which 193 (37%) were returned. Of the 193 returned consent forms, 141 (73%) agreed to let their child participate in the study. In addition to parental permission, students were given an assent form on the day of data collection describing the reason for the study, the mental health areas being assessed, and a contact person they could talk to after completing the self-report protocol. After reading the assent forms, students were told that if they wanted to volunteer for the study to sign their name at the bottom of the page. Participants for this study included only those with signed consent and assent forms.

On the day of data collection, all eligible participants completed a self-report mental health battery as part of a school-wide two-stage screening procedure (e.g., Reynolds, 1986b). The first stage consisted of adolescents completing a mental health battery that included measures of suicidal ideation, suicide attempt history, depression, and PTSD symptomatology. Other measures, such as exposure to violence and social support, were included but were not a focus of this study. Students completed the self-report battery at the same time on a designated day to minimize school disruptions. Completion of the self-report battery occurred in a large group setting of 75 to 80 people and was monitored by the author, several research assistants, and the school's principal. The test battery took approximately 45–50 minutes for most students to complete. Adolescents not participating remained in their classrooms and worked on school-related materials.

The second stage consisted of followup clinical interviews with participants who

were identified as being at-risk for suicidal behavior or depression based on the self-report screening measures. The interviews were conducted between 2 and 16 days after stage one with two semistructured clinical interviews: one assessing suicidal behavior (Suicidal Behavior Interview [SBI]; Reynolds, 1990), and the other assessing depression severity (a modified version of the Hamilton Depression Rating Scale; Reynolds, 1982). The interviews were conducted on a one-on-one basis in small private rooms in the school. Three graduate students trained in school psychology at the University of Washington–Seattle conducted the interviews. The mean number of days between the completion of the mental health battery and the clinical interviews was 5.6, with the majority of participants being interviewed between 2 and 10 days after the initial assessment.

Adolescents who had an SIQ-JR score greater than 30 or a score above 76 on the RADS during the stage one data collection were identified as being at-risk and were interviewed first for ethical reasons. Participants who were considered at-risk based on the clinical interviews were referred for additional psychological services. Of the 141 eligible students for the study, 112 (80%) agreed to participate and signed assent forms. There were 6 protocols of the 112 completed that were omitted from the study because of incomplete data or invalid responses, leaving 106 (95%) usable cases for analyses.

The data collected for this study were part of a larger study examining the relationship of exposure to violence and adolescent mental health. The procedures for data collection were approved by the Human Subjects Committee at the University of Washington–Seattle.

Group Selection

Adolescents were placed in two groups based on their score on the APS-PTS subscale. Students who had a *t* score of 65 or higher were placed in the high-risk PTSD

group, whereas those with a t score below 65 were placed in the average-risk PTSD group. A t score of 65 (93rd percentile) was chosen as the cutoff score to ensure that those students in the high-risk PTSD group were experiencing clinical levels of PTSD symptomatology.

Data Analyses

The Statistical Package for the Social Sciences for Windows (v. 7.5; SPSS, 1996) was used to analyze the data for this study. Hierarchical regression analyses were used to examine the unique relationship between PTSD symptomatology and suicidal behavior. A separate analysis was conducted for each dependent variable, current suicidal ideation, and past history of attempted suicide. Each hierarchical regression model entered the independent variables of sex as the first step, depression as the second step, and PTSD symptomatology as the third step. This statistical design allowed for examining the unique relationship (change in R^2) of PTSD symptomatology to adolescent suicidal behavior beyond the variance explained by depression and gender. Given that each hierarchical regression analysis had three independent variables, the Type I error rate of .05 was divided by 3, and resulted in .0167 statistical significance level for each predictor per analysis.

In addition to the regression analyses, t tests were conducted to compare suicidal behavior between the average-risk PTSD group and the high-risk PTSD group. Group comparisons were examined for suicidal ideation and a history of a past suicide attempt. Given that the two t tests were examining suicidal behavior, the Type I error rate of .05 was divided by the number of t tests being conducted (2), thus, the statistical significance level was set at .025 for each t test.

RESULTS

Demographic Characteristics

The demographic results for the two PTSD groups and the total sample are pre-

sented in Table 1. The mean t score for the total sample on the APS-PTS subscale was $M = 50.40$, $SD = 10.99$, with a range of 35.82 to 81.62. These results are similar to the results that Reynolds (1998b) reported in the normative sample for the APS-PTS. Females showed significantly higher PTSD scores than males, $M = 53.10$, $SD = 12.65$ and $M = 47.60$, $SD = 8.16$, respectively, $t(104) = 2.65$, $p < .01$. The mean score on the SIQ-JR for the total sample was $M = 9.49$, $SD = 13.49$, with a range of 0 to 78. SIQ-JR scores for males ($M = 7.88$, $SD = 11.53$) and females ($M = 11.04$, $SD = 15.08$) were similar, $t(104) = 1.21$, $p =$ ns. There were 11 (10.4%) students who had made a previous suicide attempt, 9 females and 2 males. Age was not a significant factor for APS-PTS scores, SIQ-JR scores, or for having made a past suicide attempt.

Correlational Analyses

The results of the correlational analyses are presented in Table 2. Using Cohen's (1977) interpretation of correlations, PTSD symptomatology showed moderate to strong correlations with a past suicide attempt, suicidal ideation, and depression, ranging from .45 to .64. PTSD symptomatology was also significantly related to gender; however, the correlation coefficient was weak, $r(104) = .25$, $p < .01$. The correlation between suicidal ideation and depression was strong, $r(104) = .68$, $p < .01$, which is consistent with results from other studies and the normative data (Mazza & Reynolds, 1998; Reynolds, 1987b, 1988). As expected, the correlation between suicidal ideation and a past suicide attempt was also strong, $r(104) = .61$, $p < .01$.

Results of the Group Comparisons

The results of the group comparisons on suicidal ideation scores and on having made a past suicide attempt are presented in Table 1. As expected, there were significantly more students in the average-risk PTSD group (93) than in the high-risk PTSD group (13), $\chi^2(1) = 60.37$, $p < .001$. In examining

TABLE 1

Demographic Characteristics and Mean Scores for PTSD Symptomatology, Suicidal Ideation, and Suicide Attempt History

| Variable | PTSD Groups | | | | |
	Average	High Risk	Total	Test Statistic	p
Participants	93	13	106		
Males	50	2	52		
Females	43	11	54		
Age M	15.61	15.83	15.63	$t(101) = .63$	=ns
SD	1.15	1.27	1.16		
Ethnicity (%)					
Caucasian	60.2	53.8	59.4		
Asian American	17.2	0.0	15.1		
African American	11.8	23.1	14.2		
Hispanic American	4.4	15.4	5.7		
Native American	3.2	7.7	2.8		
Other	3.2	0.0	2.8		
Posttraumatic Stress Symptoms					
M	47.46	71.41	50.40		
SD	7.86	6.17	10.99		
Suicidal Ideation					
M	7.86	23.85	9.49	$t(104) = 4.45$	<.001
SD	9.54	25.29	13.49		
Suicide Attempt History (%)	7.5	30.8	10.4	$\chi^2(1) = 6.63$	<.010

SIQ-JR scores, adolescents in the high-risk PTSD group showed significantly higher levels of suicidal ideation compared to peers in the average-risk PTSD group, $t(104) = 4.45$, $p < .001$. The SIQ-JR scores for individuals in the high-risk PTSD group ($M = 23.85$, $SD = 25.29$) were approximately twice as high as those in the normative sample ($M = 12.33$, $SD = 16.28$) (Reynolds, 1988). Furthermore, 23% of the students in the high-risk PTSD group scored above the designated cutoff score of 31 on the SIQ-JR (Reynolds, 1988) compared with 1% in the average-risk PTSD group. In examining suicide attempt history, students in the high-risk PTSD group were more likely to have

TABLE 2

Results of the Correlational Analyses Examining PTSD Symptomatology, Depression, Suicidal Ideation, a Past Suicide Attempt, and Gender

Variables	1	2	3	4
PTSD Symptomatology	—			
Depression	.64**	—		
Suicidal Ideation	.58**	.68**	—	
A Past Suicide Attempt	.45**	.52**	.61**	—
Gender	.25**	.17	.12	.21*

Note. *$p < .05$, **$p < .01$.

made a suicide attempt than those in the average-risk PTSD group, 30.8% compared with 7.5%, respectively, $\chi^2(1) = 6.63$, $p = .010$.

Regression Analyses

Suicidal Ideation. The results of the hierarchical regression analysis, with the independent variables of sex entered first, depression second, and PTSD symptomatology third, and suicidal ideation as the dependent variable are presented in Table 3. As shown, depression and PTSD symptomatology were significantly related to suicidal ideation scores, change in $R^2 = .452$, change in $F(1, 103) = 87.04$, $p < .001$ and change in $R^2 = .033$, change in $F(1, 102) = 6.78$, $p < .011$, respectively. The results showed that PTSD symptomatology was a significant predictor of suicidal ideation above and beyond what could be explained by depression severity and gender.

Suicide Attempt History. The results of the second hierarchical regression analysis with the independent variables of sex entered first, depression second, and PTSD symptomatology third, and history of a past suicide attempt as the dependent variable are presented in Table 4. As presented, depression was the only significant variable related to a past suicide attempt, change in $R^2 = .240$, change in $F(1, 103) = 34.62$, $p < .001$. Both gender and PTSD symptomatology showed trends toward significance, but fell outside statistical significant range. Unlike the results of the first regression analysis, PTSD symp-

tomatology was not significantly related to a past suicide attempt with depression and gender included in the model, change in $R^2 = .019$, change in $F(1, 102) = 2.73$, $p < .102$.

DISCUSSION

The current study was conducted to examine the unique relationship of PTSD symptomatology to adolescent suicidal ideation and to a previous suicide attempt. A multivariate design was used to control for the relationship between depression and PTSD symptomatology. Previous research examining psychopathology in relation to adolescent suicidal behavior has primarily focused on other disorders, particularly depression (Brent et al., 1988, 1993b, 1994; Lewinsohn et al., 1993; Shafii et al., 1988); thus, the relationship of PTSD symptomatology to adolescent suicidal behavior largely remains unknown.

As hypothesized, PTSD symptomatology was a significant predictor of adolescent suicidal ideation after controlling for depression and gender. In addition, PTSD symptomatology showed a trend in relation to a past suicide attempt with depression and gender factored out. Given that depression and PTSD symptomatology had a strong zero-order correlation, $r(104) = .64$, $p < .001$, the unique contribution of PTSD symptomatology to adolescent suicidal behavior is beyond what can be explained by depression or gender. These findings are consistent with the study by Mazza and Reynolds (1998), who

TABLE 3

Summary of the Hierarchial Regression Analysis with Independent Variables of Sex Entered First, Depression Entered Second, and PTSD Symptomatology Entered Third, and Suicidal Ideation as the Dependent Variable

Independent Variables	ΣR	ΣR^2	ΔR^2	F^*	df	p
Sex (1st step)	.117	.014	.014	1.45	1/104	<.231
Depression (2nd step)	.682	.465	.452	87.04	1/103	<.001
PTSD symptomatology (3rd step)	.706	.499	.033	6.78	1/102	<.011

Note. $^*F$ value is based on the change in R^2.

TABLE 4

Summary of the Hierarchial Regression Analysis with Independent Variables of Sex Entered First, Depression Entered Second, and PTSD Symptomatology Entered Third, and Suicide Attempt History as the Dependent Variable

Independent Variables	ΣR	ΣR^2	ΔR^2	F^*	df	p
Sex (1st step)	.210	.044	.044	4.81	1/104	<.031
Depression (2nd step)	.534	.285	.240	34.62	1/103	<.001
PTSD symptomatology (3rd step)	.551	.303	.019	2.73	1/102	<.102

Note. $^*F$ value is based on the change in R^2.

reported that PTSD symptomatology was a significant predictor of adolescent suicidal ideation after controlling for depression, violence exposure, gender, and age. Thus, the results from this study suggest that PTSD symptomatology is uniquely related to adolescent suicidal behavior and that mental health professionals working with suicidal adolescents may want to address PTSD symptomatology in addition to the suicidal behaviors themselves.

The unique relationship of PTSD symptomatology to adolescent suicidal behavior has important implications in our understanding of adolescent self-destructive behaviors. Previous research examining psychopathology in relation to adolescent suicidal behavior has primarily focused on depression and affective disorders (Brent et al., 1988, 1993a; Lewinsohn et al., 1993; Shafii et al., 1988). Although depression is highly related to suicidal ideation and moderately related to past suicide attempts, as illustrated by the zero-order correlations in this study, $r(104) = .68$, $p < .001$ and $r(104) = .52$, $p < .001$, respectively, these results suggest that PTSD symptomatology also plays a significant and unique role in adolescent suicide behavior. The results by Mazza and Reynolds (1998) suggest that PTSD symptomatology may function as a mediating variable. Mazza and Reynolds, in using the criteria for mediation set forth by Baron and Kenny (1986), showed that PTSD symptomatology mediated the relationship between exposure to chronic community violence and suicidal ideation in adolescents. Although further re-

search in this area is needed, the results of the current study provide a preliminary foundation for future research and identify PTSD symptomatology as an important factor regarding adolescent suicidal behavior.

The results of this study also show that adolescents currently showing high levels of PTSD symptomatology were more likely than their peers with average levels of PTSD to be currently thinking about suicide and to have attempted suicide. These findings are similar to what Brent and colleagues (1995) reported, that adolescents diagnosed with PTSD were more likely than their peers without PTSD to have attempted suicide. The results suggest that high levels of PTSD symptomatology is an important concurrent marker for adolescents who may be at-risk for engaging in future suicidal behavior.

The results of this cross-sectional study, although providing preliminary information for future research, needs to be cautiously interpreted. The author of this study has provided one interpretation of the results, but other interpretations may be equally valid. For example, although the relationship between PTSD symptomatology and depression was statistically controlled, a third variable or set of factors not measured in this study (i.e., family history or physical/sexual abuse) may increase adolescents' vulnerability toward experiencing PTSD, depression, and suicidal behavior. With competing explanations for interpreting these findings, further examination of cross-sectional and longitudinal data is necessary.

As suggested previously, further re-

search in the area of PTSD symptomatology and adolescent suicidal behavior is needed. The development of structural models that examine the direct, indirect, and covarying relationships of PTSD symptomatology to other mental health concerns, from both cross-sectional and longitudinal data, is important for understanding how PTSD symptomatology impacts adolescent suicidal behavior as well as other psychopathologies. It is recommended that this type of research be conducted with large sample sizes and that males and females be examined separately. Given that females tend to show higher rates of internalizing disorders in general, identifying gender-specific pathways of PTSD symptomatology in relation to adolescent mental health issues is warranted. This type of research will provide a better understanding of the relationship between PTSD symptomatology and psychological outcomes, while assisting mental health professionals and clinicians in working with at-risk youth.

The results of this study have important implications for crisis intervention teams and mental health professionals working with at-risk youth. With the increased number of adolescents being exposed to acute violent events, such as school shootings, and chronic community violence, understanding the relationship of PTSD symptomatology and other mental health concerns is important. Given that 27% of adolescents exposed to a traumatic event meet the criteria for PTSD (Fletcher, 1995), assessment of concurrent suicidal behaviors should be conducted as part of the crisis intervention or postvention process.

There are several limitations of this study that need to be mentioned. The percentage of returned consent forms was less than anticipated, 37%. One reason for the low return rate may be the geographic location of the high school, which is located in a transitory neighborhood. Despite using the updated school address list, many of the mailed consent forms were returned with no forwarding address. Given that only a fifth of the students from this high school participated, the results should be cautiously interpreted.

A second limitation to the generalizability of the results is the relatively small sample size. Although 106 participants were sufficient for the regression analyses, there were only 13 students in the high-risk PTSD symptomatology group. Fortunately, none of the 13 students had unusually high scores; however, cautious interpretation of the group comparisons is recommended until further research with larger samples is conducted to confirm these results.

Lastly, the sample for this study was located in a transitory suburban area of a large metropolitan city. Although there were more students with a PTSD symptomatology t score at or above 65 than expected, it is not known if inner city or rural adolescents would show similar rates. Therefore, the results of this study should not be generalized to inner city or rural adolescents without further research that includes these adolescent populations.

The current study showed that PTSD symptomatology was significantly related to adolescent suicidal behavior, specifically suicidal ideation and suicide attempt history, after controlling for depression and gender. In addition, adolescents with high levels of PTSD symptomatology had greater levels of suicidal ideation and were more likely to have made a past suicide attempt than peers with average levels of PTSD symptomatology. These results suggest that PTSD symptomatology plays an important unique role in adolescent suicidal behavior. Further research investigating the impact of PTSD symptomatology, examining both direct and indirect effects, in relation to adolescent suicidal behavior as well as other psychological concerns is needed. Such research would facilitate our understanding of the unique role of PTSD symptomatology within the domain of adolescent mental health and assist clinicians and mental health professionals in working with at-risk youth.

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