

# Posttraumatic Stress, Depression and Social Support Among College Students After Hurricane Andrew

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*A survey of 220 college students conducted one month after Hurricane Andrew hit Southern Florida included an impact assessment, the Inventory of Socially Supportive Behaviors, the Reaction Index, the Center for Epidemiological Studies Depression Inventory (CES-D), the State/Trait Anxiety Inventory, and a Pre-/Post-hurricane Stressors and Hassles Survey. Students who reported having experienced the most severe impact damage from the storm also reported having experienced the most stress, anxiety, and depressive symptoms. Nearly half of the students who sustained high damage to their dwellings could be classified as depressed. Regression analyses revealed that material and emotional social support were significant predictors of anxiety and depression scores after the storm.*

Much of the research on posttraumatic stress disorder (PTSD) has focused on war trauma or on personal trauma such as accidents, rape, or the loss of a family member (see Choy & de Bossett, 1992). Other researchers have examined stress reactions following natural disasters, such as hurricanes (Belter, Dunn & Jency 1991; Lonigan, Shannon, Finch, Dougherty & Taylor, 1991), fires (McFarlane, 1988), floods (Stout & Knight, 1990), tornadoes (Madakasira & O'Brien, 1987), earthquakes (de la Fuente, 1986; Nolen-Hoeksema & Morrow, 1991) and volcanoes (Murphy, 1988; Shore, Vollmer & Tatum, 1989). However, no prior studies have

specifically been focused on the effects of a major natural disaster on the well-being of a large body of college students.

There are many theoretical approaches to the understanding of posttraumatic stress reactions; from learning theories to psychodynamic theories to cognitive theories (see Chemtob, Roitblat, Hamada, Carlson & Twentyman, 1988). Most theorists have focused on the etiology of individual posttraumatic stress reactions; however, others have recently discussed the role of social factors—such as social support—as mediators of posttraumatic reactions (Green, Grace, Lindy, Gleser & Leonard, 1990; Kaniasty & Norris, 1993; Kinzie, 1989; Solomon, Smith, Robins & Fischbach, 1987). Social support may reduce the effects of stressors and facilitate recovery following traumatic events (Cobb, 1976; Cohen & Wills, 1985; Dean & Lin, 1977). However, no prior research studies have been specifically aimed at examining the effects of a major disaster on college students, or the role of students' social support in mediating their reactions to the disaster.

In the present survey students whose community was hit by Hurricane Andrew on August 24, 1992, were studied. Specifically, the psychological effects of the hurricane and the role of social support in mediating the students' reactions to the disaster were examined. Hurricane Andrew was a Class 4 storm with winds of over 160 miles per hour, and was one of the most

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damaging storms in U.S. history, causing numerous injuries and deaths and over \$18 billion in property damage.

Victims of large natural disasters typically report more anxiety, intrusive memories, sleep disturbances, memory and attentional impairment and other symptoms of posttraumatic stress disorder than nonexposed controls (see Chemtob et al., 1988; Epstein, 1989; Lyons, 1987). However, it is not clear from prior studies whether the severity of victims' reactions to a disaster are in proportion to the amount of personal damage and stressors the victims experienced, or whether the reactions are mediated by psychological factors. Although individuals experiencing the most severe losses due to a disaster might be expected to experience the most negative effects, reports have suggested that it is not intensity of exposure but psychological factors (e.g., neuroticism, introversion, doubts about self-efficacy) that are the best predictors of PTSD (McFarlane, 1988; Murphy, 1988; Nolen-Hoeksema & Morrow, 1991). Since few researchers have examined the effect of disasters on college students, there is little data on the extent to which psychological factors and social support might interact to modulate posttraumatic responses.

From anecdotal accounts, some individuals affected by a disaster, even in areas hit the hardest, appear resilient and immediately initiate recovery efforts. Other victims appear lost, hopeless, depressed, and unable to cope. Because depression has been associated with a more negative perceptual bias (Beck, 1976; Coyne & Gottlieb, 1983), disaster victims exhibiting more depressive symptoms might be expected to report more postdisaster hassles and, in turn, to become more distressed. Further, because social support has been hypothesized to buffer against stress (Cobb, 1976; Cohen & Wills, 1985; Dean & Lin, 1977), higher levels of social support may help some students cope with the posttraumatic stress reaction and reduce it. However, other students may have less social support or may not effectively use their social support network as a buffer against stress. In this study the hypotheses were that: (a) students reporting the most severe impact from the hurricane would show the most

severe stress reactions, (b) students who were more depressed would perceive more stressors or "hassles", and (c) students with greater social support would show less severe stress reactions. It was also predicted that a "high-risk" group, defined as students in high-impact areas who demonstrated the highest levels of depressive and/or anxiety symptoms (see Methods section), would require the most social support. In the current survey assessed the relationship between social support, PTSD, anxiety, and depressive symptoms in college students were assessed exactly one month after Hurricane Andrew had hit their community.

## METHOD

Questionnaires were given to 220 psychology students ranging in aged 19 to 28 years ( $M = 21.2$  years). Fifty-nine percent of the sample were Caucasian, 31 percent were Hispanic and 10 percent were African-American; 87 percent were unmarried; and 74 percent were females. The students were college juniors and seniors ( $M = 14.6$  years total education) from a generally middle-class background as assessed using the Hollingshead Four Factor Index of Social Status ( $M = 2.97$ ; Hollingshead, 1975). Eighty-six percent of the students lived off campus. All students were enrolled in an undergraduate Introduction to Psychology course and received course credit for participation in the survey. Informed consent was obtained before they completed the survey, and a debriefing statement (including encouragement to obtain free counseling) was provided to the students after they completed the questionnaire.

## Measures

*Impact Assessment.* Eighteen questions, developed by the authors of the current survey, were used to assess each respondent's location and experiences during and immediately after the hurricane. The questions dealt with specific damage to each student's home and other property: for example, "How many windows were broken in your residence?" "What was the damage to the roof and structure of your dwelling?" "Was furniture damaged?" "Were

personal belongings lost?" "Were you forced to relocate and for how long?". Additional questions targeted students' experiences during the storm: for example, "Did you fear for your safety?" "Did you hide in the closet or bathroom during the hurricane?" "Did you or anyone with you get hurt during the storm?" Damage scores were the basis for classifying victims into a high-impact versus low-impact group (see Results section).

*Reaction Index.* The Reaction Index developed by Frederick (1985) was used to assess emotional reactions and PTSD symptoms after the hurricane. Statements included ones such as the following: "I am jumpy, edgy and more easily startled than before the hurricane," "Dreams about my hurricane experience keep coming back," "I have had stomachaches, headaches or other signs of illness since the hurricane," and "My concentration is not as good as it was before." The students indicated how often each statement was true for them, using a 5-point Likert scale with response alternatives ranging from (1) *none of the time* to (5) *most of the time*.

*Center for Epidemiological Studies Depression Scale.* On the Center for Epidemiological Studies Depression Scale (CES-D) developed by Radloff (1977), students indicated how often they "felt in this way during the past week" for each of 20 statements such as "I felt sad," "I had crying spells," "I could not 'get going.'" Respondents rated each item on a 4-point Likert scale ranging from (1) *rarely or none of the time (less than 1 day)* to (4) *most of the time (5 to 7 days)*. Respondents' scores on the CES-D were used to classify each student as "depressed" or as "nondepressed" (see Results section).

*State-Trait Anxiety Inventory* The state portion of the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch & Lushene, 1970) was used to assess the students' current level of anxiety. Students indicated their agreement with each of 20 statements (e.g., "Right now I feel worried," "Right now I feel anxious," "Right now I feel nervous"), using a 4-point Likert scale ranging from (1) *not at all* to (4) *very much*.

*Inventory of Socially Supportive Behaviors.* The Inventory of Socially Supportive Behaviors (ISSB; Barrera, Sandler & Ramsay, 1981), a 40-

item questionnaire, was used to assess the social support that students received since the hurricane. Students responded "yes" or "no" to each statement describing the type of support. In an earlier standardization of the scale, Barrera and Ainlay (1983) had identified four categories of social support: (a) The Directive Guidance factor (14 items) refers to advice, guidance, and instrumental support (e.g., "Is there someone who gave you information on how to do something?" "Is there someone who suggested some action you should take?"). (b) The Nondirective Guidance factor (8 items) dealt with emotional support, trust, or love (e.g., "Is there someone who told you he/she is there if you need them?" "Is there someone who comforted you by showing you affection?" "Is there someone who told you he/she feels close to you?"). (c) The Positive Social Support factor (6 items) referred to feedback, social rewards, or encouragement (e.g., "Is there someone who let you know you were doing something right?" "Is there someone who has tried to cheer you up?"). (d) The Tangible Assistance factor (12 items) referred to material support and the offering of money or goods (e.g., "Is there someone who has given you over \$25.00?" "Is there someone who has provided you with some transportation?" "Is there someone who has provided you with a place to stay?"). Reliability analyses revealed alpha coefficients of .88, .81, .80, and .81, respectively, for the four subscales (a to d, above) indicating good internal consistency reliability for items making up these subscales. Previous studies indicate that the ISSB was significantly correlated with the Arizona Social Support Interview Schedule ( $r(43) = .422, p < .01$ ), a structured interview assessing quality of social support networks, thus supporting the ISSB's construct validity (Barrera et al., 1981). Both the ISSB total score and individual subscale scores were analyzed in the current study.

*Pre- and Posthurricane Stressors and Hassles Survey:* The Pre- and posthurricane stressors and hassles survey consisted of 12 questions developed by the authors, with items created to be similar to other authors' measures of life stress (Kanner, Coyne, Schaefer & Lazarus, 1981; Sarason, De Monchaux & Hunt.

1975) but modified for the purpose of measuring postdisaster stressors. Students were asked to rate how much various activities posed problems before and after the hurricane, and they used a 4-point Likert scale with response alternatives ranging from (1) *no hassle* to (4) *a big hassle*. Items included common daily activities (e.g., "Getting around town by car, bus or other transportation," "Getting supplies like food and water," "Getting services such as telephone, electricity, water or postal deliveries," "Getting help with repairs and cleaning up"), as well as other "lifestyle" issues (e.g., "Finding time for myself to relax," "Getting along with family and friends"). The difference between the pre- and postscores were computed as an index of the change in perceived stressors and hassles due to the hurricane.

## RESULTS

Analysis of total scores on the Impact Assessment were examined to determine the range and severity of the hurricane's impact. Scores ranged between 2 and 17 ( $M = 6.36$ ,  $SD = 3.03$ ) indicating that the students experienced widely varied impacts. All students surveyed reported moderate to severe damage to their dwellings, 59.5% reported having felt "personally threatened" by the storm, all students reported a loss of electrical service for between 6 and 30 days after the storm, and 88% of the respondents reported "moderate to severe difficulty" acquiring food, water, and/or assistance with repairs and cleaning up after the hurricane.

### Comparison of High- and Low-Impact Groups

To explore how different levels of damage and severity of the hurricane experience were related to other outcome measures, subjects were assigned to either a "low-impact" or a "high-impact" group based on their scoring above or below the median (6.00) on the Impact Assessment. Data for 20 subjects with scores of exactly 6.00 on the Impact Assessment were eliminated from the analysis, so that the high- and low-impact groups ( $N = 119$  and 80, respectively) included only subjects scoring above or below this median score.

Multivariate analysis of variance on the Reaction Index, STAI, and Hassles Index scores with impact group (two levels) as a main factor revealed a significant main effect of impact group ( $F[3, 198] = 27.33$ ,  $p < .001$ ). Comparison of the high-impact ( $N = 119$ ) and low-impact ( $N = 80$ ) groups revealed differences in total scores on the Reaction Index ( $M = 45.6$  vs. 32.5;  $t[198] = 8.09$ ,  $p < .001$ ), STAI ( $M = 41.5$  vs. 37.6;  $t[198] = 2.25$ ,  $p < .05$ ), and the Pre- and Posthurricane Stressors and Hassles Survey change scores ( $M = 15.5$  vs. 8.9;  $t[198] = 6.79$ ,  $p < .001$ ).

Analysis of CES-D Depression Inventory scores revealed that students in the high-impact group showed significantly higher scores, and thus more depressive symptoms, than did students in the low-impact group ( $M = 17.1$  vs. 10.3;  $t[198] = 4.29$ ,  $p < .001$ ). Of the 119 subjects, 51 (43%) scored above the CES-D "depressed" cutoff score of 16 in the high-impact group, in contrast to only 19 out of 80 subjects (24%) in the low-impact group ( $X^2 = 10.14$ ,  $p < .01$ ).

Analysis of scores from the Inventory of Socially Supportive Behaviors revealed differences in received social support between the high- and low-impact groups. A MANOVA performed on each of the four subscale scores from this scale, with impact group (2 levels) as the main factor, revealed a significant main effect of impact group ( $F[4, 198] = 4.17$ ,  $p < .01$ , Wilks's Lambda = .92), which indicated that greater social support was sought and received by students who experienced the most damage and perceived a threat of bodily harm. Univariate tests revealed that this was the case for Total Social Support, as well as for Directive Support, Nondirective Support, Positive Support and Tangible Assistance ( $p < .01$  for all tests; see Table 1). These analyses showed that those in the high-impact group reported stronger emotional reactions, more anxiety, more hassles, and greater depression after the storm, but they also reported receiving more social support.

### Comparison of Depressed and Nondepressed Groups

To assess the differential effects of depression, subjects were classified as "depressed" or

TABLE 1  
Comparison of Mean Scores for the High and Low Impact Groups

Scale	GROUP		p level
	Low-Impact	High-Impact	
Reaction Index	32.5 ( 7.2)	45.6 (13.6)	.001
CES-D	10.3 ( 9.7)	17.1 (11.9)	.001
State Anxiety	37.6 (11.2)	41.5 (12.9)	.05
Hassles	8.9 ( 6.1)	15.5 ( 7.3)	.001
<i>Social Support</i>			
Directive	6.7 ( 4.7)	8.2 ( 3.8)	.01
Nondirective	5.5 ( 2.6)	6.6 ( 1.8)	.001
Positive	4.2 ( 1.9)	5.0 ( 1.5)	.001
Tangible Assistance	5.0 ( 3.4)	6.6 ( 2.9)	.001
Total Social Support	21.4 ( 8.4)	26.3 (11.0)	.001

Note. Standard deviations are shown in parentheses.

"nondepressed" groups on the basis of their scores on the CES-D scale (score > 16 = depressed or score < 16 = nondepressed). This application of the scale corresponded with other researchers' use of it (Radloff, 1991), although subjects classified in this way are not considered clinically depressed. The mean scores of the depressed and nondepressed subjects in the high- and low-impact groups are shown in Table 2.

Multivariate analysis of variance on the Reaction Index, STAI and Stressors/Hassles scores with depressed group (depressed, nondepressed) as the main between- subjects factor revealed a significant main effect of group ( $F[3, 199] = 45.3, p < .001$ , Wilks' Lambda = .59). A univariate analysis of variance on the Reaction Index scores with depressed classification

(depressed, nondepressed) and with impact group (high, low) as factors revealed significant effects for impact group ( $F[1, 198] = 50.54, p < .001$ ), for depressed group ( $F[1, 198] = 70.95, p < .001$ ) and an Impact Group x Depression Group interaction effect ( $F[1, 198] = 8.43, p < .005$ ). Significantly higher Reaction Index scores were observed for the high-impact/depressed versus high-impact/nondepressed group ( $M = 54.5$  vs. 38.6;  $t[118] = 7.62, p < .001$ ), and in the low-impact/depressed versus low-impact/nondepressed group ( $M = 37.7$  vs. 30.9;  $t[79] = 3.90, p < .001$ ).

Analysis of variance on STAI scores with impact group (high, low) and depressed classification (depressed, nondepressed) as the main factors revealed a significant effect for depressed group ( $F[1, 198] = 74.74, p < .001$ ), with no

statistically significant main effects or interactions with the impact group factor. This effect was due to higher STAI scores for the depressed versus the nondepressed groups ( $M = 49.2$  vs.  $35.5$ ;  $t[218] = 9.42$ ,  $p < .001$ ), and this was apparently consistent across the high- and low-impact groups.

To assess differences across groups in the perceived change in the Stressors and Hassles Survey following the hurricane, an ANOVA was performed on the pre- versus post-hurricane hassles score with depression group (depressed, nondepressed) and impact group (high, low) as the main factors. This analysis revealed a significant effect of depression ( $F[1, 198] = 20.7$ ,

$p < .001$ ) and for impact group ( $F[1, 198] = 34.5$ ,  $p < .001$ ), with no statistically significant interaction effects. Depressed respondents reported a greater increase in stressors and hassles following the hurricane than did nondepressed subjects in both the high- and low-impact groups (see Table 2).

#### Relationship Between Social Support and Posttraumatic Stress

Pearson product-moment correlations revealed that all subscales of the Inventory of Socially Supportive Behaviors were highly correlated with one another and with the total score ( $r = .52$  to  $.74$ ,  $p < .01$  or less). To assess whether social support

TABLE 2  
Reaction Index, State Anxiety and Stressors/Hassles Scores of Subjects Classified as Depressed and Nondepressed in the High- and Low-Impact Groups.

	Low-impact		High-impact		Effect
	Dep.	Nondep.	Dep.	Nondep.	
Reaction Index	37.7 <sup>a</sup> ( 8.1)	30.9 <sup>b</sup> ( 6.3)	54.5 <sup>c</sup> (13.0)	38.6 <sup>a</sup> ( 8.3)	I, D I x D
State Anxiety	49.3 <sup>a</sup> (11.8)	34.2 <sup>b</sup> ( 8.5)	49.2 <sup>a</sup> (11.9)	35.5 <sup>b</sup> ( 9.6)	D
Stressors/Hassles	10.6 <sup>a</sup> ( 7.2)	8.4 <sup>a</sup> ( 5.3)	18.7 <sup>b</sup> ( 6.8)	13.1 <sup>c</sup> ( 6.7)	I, D
<i>Social Support:</i>					
Directive	7.4 <sup>a</sup> ( 3.6)	6.5 <sup>a</sup> ( 4.7)	8.0 <sup>b</sup> ( 4.4)	8.4 <sup>b</sup> ( 3.5)	I
Nondirective	5.7 <sup>a</sup> ( 2.1)	5.4 <sup>a</sup> ( 2.7)	5.9 <sup>b</sup> ( 1.8)	7.1 <sup>c</sup> ( 1.1)	I, I x D
Positive	4.6 <sup>a</sup> ( 1.7)	4.4 <sup>a</sup> ( 1.9)	4.6 <sup>a</sup> ( 1.8)	5.4 <sup>b</sup> ( 1.1)	I, I x D
Tangible Assistance	5.0 <sup>a</sup> ( 3.5)	5.0 <sup>a</sup> ( 3.4)	6.3 <sup>b</sup> ( 3.0)	6.8 <sup>b</sup> ( 2.5)	I
Total Social Support	22.6 <sup>a</sup> ( 8.6)	21.0 <sup>a</sup> (11.7)	27.5 <sup>b</sup> ( 9.5)	24.9 <sup>b</sup> ( 7.2)	I

Note. Main effects shown were significant at the  $p < .05$  level:

I = Impact group, D = Depressed group, I x D interaction.

Means with different subscripts differ at  $p < .05$  or less in post-hoc Bonferroni  $t$  tests.

was a predictor of posttraumatic stress outcomes, stepwise regression analyses were performed with the Reaction Index, STAI, and Stressors/Hassles scores entered as dependent measures.

When the scores for all subjects were included in the regression analyses, none of the social support subscales significantly entered into the equation. Therefore, separate analyses were used to assess whether social support predicted posttraumatic stress for groups defined by levels of hurricane impact and/or depression. The analyses revealed that social support was a significant predictor only for anxiety, and only in the highest risk groups. Specifically, Nondirective Support and Tangible Assistance accounted for 9% of the variance in STAI scores in the high-impact group ( $R^2 = .09, p < .01$ ), 10% in the depressed group ( $R^2 = .10, p < .05$ ), and 31% in the depressed/high-impact group ( $R^2 = .31, p < .001$ ). Thus, higher Nondirective Support and Tangible Assistance were associated with lower STAI anxiety scores in these high risk groups. No other relationships between social support and the other dependent measures were observed.

## DISCUSSION

The present survey confirmed the presence of a wide range of posttraumatic stress symptoms and other problems for college students after Hurricane Andrew. Many students reported posttraumatic symptoms, including intrusive thoughts about the hurricane, sleep disturbances, somatic complaints, memory and attention deficits, and symptoms of anxiety and depression. Individuals who experienced the greatest damage to their property and more fear of personal injury reported the most severe posttraumatic symptoms. These findings are in general agreement with other investigations of the psychological aftereffects in older, non-student adult populations following natural disasters (Belter, Dunn & Jeney 1991; de la Fuente, 1986; Lonigan et al., 1991; McFarlane, 1988; Madakasira & O'Brien, 1987; Murphy, 1988; Nolen-Hoeksema & Morrow, 1991; Shore, Vollmer & Tatum, 1989; Stout & Knight, 1990).

When students were stratified according to the severity of their hurricane experience, those

in the high-impact group demonstrated higher (more symptomatic) scores on every measure. For example, more subjects in the high-impact group could be classified as "depressed" on the basis of their CES-D scores. Subsequent analyses revealed that respondents classified as "depressed" had higher Reaction Index PTSD scores and higher anxiety scores, and reported more problems and hassles after the hurricane. Thus, students who experienced the greatest exposure and loss and who perceived a threat of personal injury from the disaster reported the greatest posttraumatic stress reactions.

The positive relationship between impact severity and magnitude of posttraumatic reaction, in other words a type of "dose-response" relationship, has also been observed by other researchers (Lonigan et al., 1991; Pynoos, Frederick, Nader and Arroyo, 1987; Shore, Tatum & Vollmer, 1986). Some researchers have suggested that psychological predispositions may be better predictors of PTSD than severity of impact variables (McFarlane, 1988), however the absence of premorbidity data makes it difficult to assess this view from the current study. Because the hurricane had such widespread effects, it was not possible to survey a completely unexposed no-impact control group to compare with the low-impact and high-impact groups in this study. Because college campuses rarely carry out widescale student psychological assessments it is unlikely that postdisaster service providers will possess data on each student's prior level or predisposition to stress or depression. Therefore, the present data seems to show that intervention resources must be allocated primarily on the basis of postdisaster psychological and needs assessments.

Many undergraduate students in the current survey reported depressive symptoms. This confirms reports after Hurricane Hugo which suggested that the most common and widespread emotional response to such a disaster is a type of low-grade dysthymia (Austin, 1991). In the current study, students in the high-impact group reported the highest incidence of depressive symptoms. These students may therefore constitute a high-risk category, because they exhibited the greatest PTSD reactions, as indexed by their

higher Reaction Index and Anxiety Inventory scores. One must recognize, however, that prehurricane depression was not measured in the current sample (see Robins et al., 1986; Bravo et al., 1990).

Lonigan (1993) suggested affectivity, either positive or negative, may be a trait like characteristic that moderates reactions to disasters (Lonigan, 1993). Unfortunately, data on pre-morbid factors such as depressive symptoms before a disaster are rarely available. In one study, however, the researchers found that individuals who were assessed as more depressed before the Loma Prieta earthquake showed more depression and stress symptoms following the disaster (Nolen-Hoeksema & Morrow, 1991). In the current survey, undergraduate students with higher levels of depressive symptoms showed higher PTSD Reaction Index and STAI scores, suggesting that these subjects' posttraumatic reactions may have been modulated by their negative affectivity. Thus future postdisaster counseling might be targeted to students identified as "at-risk" through screenings for depressive and anxious symptoms.

Social support was not found to be a general predictor of PTSD Reaction Index, Depression or Anxiety scores in the analyses of data for the entire sample. However, differences in social support mediation of PTSD were observed as a function of severity of the hurricane's impact on the students. For example, subjects in the high-impact group reported significantly more Tangible Assistance received than subjects in the low-impact group. This was not surprising because those who experienced the most damage would be expected to need the most material assistance from their families. However, this high-impact group also reported significantly more Directive, Nondirective and Positive types of social support, which suggested a general mobilization of social support resources in this group occurred during the first few weeks after the disaster. These data suggest that college students hardest hit by a disaster sought not only financial assistance, but also emotional support and social reinforcement from their families and friends. Thus, social support was important in the students' healing and recovery process after

a disaster, and this finding is in general agreement with prior research on other populations (Cohen & Wills, 1985; Green et al., 1990).

Nondirective Support and Tangible Assistance were also observed to be significant predictors of anxiety scores in the high-impact/depressed group. Thus social support did appear to mediate anxiety reactions, at least in the high-impact group. Although this contrasts with other researchers' suggestion that social support is *not* a key predictor of PTSD (Murphy, 1988), differences in the importance of social support as a mediator of PTSD across studies may be accounted for by several factors. First, in prior studies social support was typically examined as a predictor of long-term outcomes (months to years) after a disaster, whereas the current survey was conducted 4 weeks after the disaster. Second, in earlier studies respondents may not have been assessed in terms of "high risk" categories, and the effects of social support may not have been as evident in the general samples. Third, the various interview measures used in previous studies to examine clinical PTSD may not overlap with the "subclinical" PTSD reactions manifest in self-report measures of anxiety, depression, and posttraumatic reactions as examined in the current survey. For the students assessed in this study, both emotional and material support clearly were primary factors in facilitating their recovery and return to normal college life.

This is the first study designed to examine specifically the effects of a major disaster on a large group of college students. The data appear to confirm other findings that people with the most severe PTSD reactions after a disaster are those hardest hit by the disaster, those who feel anxious and depressed, and those who have inadequate social support or social support utilization (Madakasira & O'Brian, 1987). Thus, future posttrauma campus intervention efforts might be specifically targeted to students in specific high risk groups. For example, out-of-state students, who cannot readily receive familial support, may require more on-campus counseling and financial assistance services. Simple self-report screenings might also be used to determine which students have been most



affected by a traumatic event and which have more depressive or anxious symptoms. These should be the first students to be offered posttrauma counseling.

Posttraumatic reactions observed following a natural disaster such as a hurricane may be similar to student reactions to homicides, suicides, accidental deaths and other crises that have occurred at colleges and universities. Student service administrators, psychological counseling services, resident hall assistants and others should therefore plan for the inevitable emergencies which impact college students. The current findings suggest that providers might plan to conduct some form of student assessment following such crises, and then target services specifically to students exhibiting a higher risk for PTSD reactions.

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