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PSYCHOLOGICAL SEQUELA OF HURRICANE HUGO: AN APPLICATION OF THE CONSERVATION OF RESOURCES MODEL OF STRESS

By

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Final Report

Psychological Sequela of Hurricane Hugo:
An Application of the Conservation of Resources Model of Stress*

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I. Statement of the Problem to be Studied

On September 21, 1989, hurricane Hugo came ashore at Charleston, South Carolina. A category V hurricane, Hugo ravaged the coastline with sustained winds of 135 mph and tidal surges 15 to 20 feet above high tide. Not only was Hugo one of the most powerful storms to hit the continental U.S., but also one of the largest. Hurricane force winds radiated 100 miles from its center, and tropical force winds extended 200 miles from the eye. Consequently, the damage caused by Hugo was unprecedented: approximately 3 million people were affected; 26 lives were lost; and 343 people were injured. Seventeen thousand people were left jobless; over 5,300 homes were destroyed; and another 18,000 homes were rendered uninhabitable. In the Charleston area alone, property damage estimates were in excess of $4 billion.

Although the estimated losses are impressive, the negative psychological effects of a disaster of this magnitude are more difficult to describe and understand. Some help in this regard is provided by the Diagnostic and Statistical Manual of Mental Disorders - Revised (DSM-III-R) which describes the psychological sequela of trauma and recognizes Post-traumatic Stress Disorder (PTSD) as a diagnostic category. In the DSM-III-R framework, PTSD symptomatology includes: recurrent and intrusive recollections of the traumatic event (e.g., recurrent dreams, flashbacks); avoidance of stimuli associated with the trauma or numbing of responsiveness (e.g., inability/refusal to recall details of the event, diminished interest in significant activities); and increased arousal (e.g., sleep disturbances, irritability, inability to concentrate). Associated complications of PTSD include depression, anxiety, and increased substance use. Hence, following a disaster it seems important to monitor acute PTSD symptoms as well as identify groups of people who are at increased risk for long-term problems stemming from the disaster.

Although the DSM-III-R describes the psychological sequela of disasters, it does little to help us understand these reactions. Indeed, most of the studies investigating psychological reactions to disasters (e.g., Lystad, 1985; Hartsough, 1985) have been hampered by the absence of a conceptual model of how stress reactions occur. Moreover, this lack of an adequate conceptual model represents a serious flaw in the stress literature in that theoretical models provide an important framework to guide research, increase our conceptual understanding of clinical problems, and improve our ability to provide clinical services.

Fortunately, this shortcoming in the stress literature has recently been addressed by Hobfoll (1988) who proposed a theoretical model for conceptualizing stress and stress reactions. The model, called the Model of Conservation of Resources, is based on the supposition that people strive to retain, protect, and build resources. The model identifies four types of resources: object resources (e.g., property, material belongings); conditions (e.g., marriage, job roles); personal characteristics (e.g., self-esteem, sense of control); and energies (e.g., time, money). An event or situation is defined as stressful if these resources...
are threatened or lost. According to this model, the impact a stressful event has on an individual is related to the perceived or actual loss of resources, how essential these resources are for the individual's survival, and the individual's coping style.

Because the Conservation of Resources Model proposed by Hobfoll represents an important advance in the stress literature, the proposed study applied this model in order to investigate the psychological sequela of hurricane Hugo. Specifically, the project sought to determine whether hurricane-related losses suffered by the students and faculty of the Medical University of South Carolina affected their reports of PTSD symptomatology, depression, anxiety, alcohol and substance use, and other health-risk behaviors (e.g., diet and exercise) following Hugo.

II. Research Questions to be Answered

The overall goal of this project was to generate empirical data which would allow us to evaluate the applicability of Hobfoll's theoretical model of stress for predicting psychological response to natural disasters. In order to accomplish this goal, the following specific objectives for the project were identified:

A. To describe and quantify the symptoms of psychological distress experienced by our sample following hurricane Hugo.

B. To describe and quantify the types of losses suffered by our sample as a result of Hugo.

C. To determine whether resource loss was correlated with psychological distress and/or coping behavior.

D. To identify variables that were predictive of psychological distress following Hugo and determine which variables among resource loss, personal characteristics, and coping behaviors were most predictive of distress.

E. To determine whether high resource loss compared to low resource loss, was associated with greater prevalence of clinically significant psychological distress following hurricane Hugo.

F. To determine which types of resource loss were most important in explaining psychological distress following hurricane Hugo.

G. To determine the effect of gender on self-reported resource loss following Hugo.
H. To determine whether psychological distress following hurricane Hugo was effected by gender or the extent of loss of resources.

I. To provide normative data about the patterns of alcohol and medication use by our sample after hurricane Hugo.

J. To identify subject variables (e.g., gender and pre-Hugo drinking patterns) that were associated with increased use of alcohol and medications following hurricane Hugo.

K. To collect normative data that documents changes in health habits following hurricane Hugo.

L. To determine whether gender and the extent of loss of resources were associated with disruption in health-related behaviors following Hugo.

III. Methodology of the Study

A. Methods: Approximately eight weeks after hurricane Hugo struck Charleston, South Carolina, 1,200 faculty of the Medical University of South Carolina (MUSC) in Charleston were sent via the campus mail, a packet of assessment instruments. Included in the packet was a cover letter that explained the purpose of the study, insured confidentiality, and provided instructions on completing the questionnaires. Eight weeks after Hugo struck, the same packet of information was distributed to 275 MUSC students during their class time. Individuals who completed the survey were given the opportunity to enter a drawing for two gourmet dinners valued at $120. Return envelopes and an entry form for the drawing were also included in the packet.

B. Assessment instruments (See Appendix I for a copy of each assessment instrument):

1. Demographic questionnaire. This questionnaire provided basic demographic information about the subjects including their sex, race, marital status, education level, and annual income. It also provided information about previous exposure to other natural disasters, dollar value of property lost as a result of the hurricane, and the respondent's whereabouts when the hurricane actually struck.

2. Resource Loss Questionnaire. Hobfoll's original Resource Loss Questionnaire (RLQ) was modified to obtain a 52-item self-report
inventory on which subjects used a 4-point Likert scale to rate the extent to which Hugo resulted in the loss or threatened loss of 52 resources (e.g., property, money, self-esteem, and leisure time). Although the scale yields a separate score for each type of resource identified by Hobfoll (i.e., Objects, Conditions, Personal Characteristics, and Energies), the total resource loss score (unless specified otherwise) was used in the data analyses.

3. COPE Questionnaire. This 60-item self-report inventory provides 15 4-item scales (Carver, Scheler, and Weintraub, 1989). Subjects used a 4-point Likert scale to indicate the extent to which they had used, after the hurricane, each of the 60 coping behaviors listed. A rating of 0 indicated that they had not used that behavior "at all," and a rating of 3 indicated they had used the behavior "a lot." The subjects' scores for each of the 15 scales were used as raw data for a principle component factor analysis with Varimax rotation to produce the three coping factors used in this study: problem-focused coping, emotion-focused coping, and disengagement coping.

4. Symptom Checklist-90 Revised (SCL-90-R). This 90-item self-report questionnaire devised by Derogatis (1983) was used by subjects to report on a 5-point Likert scale the extent to which they experienced 90 symptoms (e.g., headaches, feelings of guilt, trembling, and feeling blue) following hurricane Hugo. The Global Severity Index score from the SCL-90-R was used in the data analyses as a measure of overall psychological distress following hurricane Hugo.

5. Health Habits Questionnaire. We developed this 52-item questionnaire to evaluate weight changes, food choices, eating patterns, exercise patterns, alcohol use, and prescription medication use following hurricane Hugo.

IV. Sample Characteristics

A. Faculty Sample

1. Size of sample: 525; response rate = 43%.

2. Gender: 51% male; 49% female.

3. Age: mean age = 40.46 years; range = 19 to 77 years.
4. Race: 92% white; 4% black; 4% other.

5. Marital status: 68% married; 21% single; 10% separated or divorced.

6. Education (highest degree earned): 74% graduate; 11% bachelors; 12% technical degree.

7. Annual household income: $10,000-$40,000 - 27%; $40,000-$50,000 - 14%; $50,000 or more - 58%.

B. Student Sample

1. Size of sample: 202; response rate = 73.5%.

2. Gender: 43.1% males; 56.9% females.

3. Age: mean age = 23.95 years; range = 19 to 49 years.

4. Marital status: 77.7% single; 19.8% married; 2.5% separated or divorced.

5. Race: 87.6% white; 7.9% black; 4.5% other.

6. Education (highest degree earned): 8.5% graduate; 57.5% bachelors; 12% associate degree; 17.5% high school; 4.5% other.

7. Annual household income: $10,000 or less - 56.2%; $10,000-$20,000 - 13.9%; $20,000-$30,000 - 10.8%; $30,000-$50,000 - 2.6%; $50,000 or more - 7.7%.

V. Results

Because the data for the faculty sample were analyzed separately from the data for the student sample, the results for these samples will be reported separately. The section detailing the data from the student population will include comparisons of the student data with the corresponding data from the faculty sample. The results will be reported in the same order used to list the specific objectives for the project (See pages 2 and 3 of this report.). In addition, for each result reported, the objective it addresses will be noted.
A. Results for the Faculty Sample

1. Objective A: In order to quantify the psychological distress reported by our faculty sample, the mean SCL-90-R profile for men and the mean profile for women were calculated as shown in the graph presented in Appendix II. Inspection of this graph shows that for both the men and women, the mean T-scores on the SCL-90-R clinical scales fell in the range of 50 to 63, with only the mean T-score for women (T-score = 63) on the Obsessive-compulsive scale approaching the range of scores which indicates clinically significant symptoms (T-score ≥ 65). Although the mean scores on the SCL-90-R scales were not clinically elevated for males or females, 9.9% of females and 6.3% of males fell above a T-score of 65 on the SCL-90-R Global Severity Index (GSI) for nonpatient norms. This finding indicates a sizable proportion of the faculty sample suffered from clinically relevant psychological distress following hurricane Hugo.

2. Objective A: The five SCL-90-R items which were most frequently endorsed by the faculty sample are listed below in Table 1 with the percentage of the total group endorsing each item noted. For more detailed information regarding the 10 SCL-90-R items most frequently endorsed by the sample and the percentage of males and females endorsing each of these items, please see Appendix II. Examination of the data in Appendix II indicates that the symptoms of distress most frequently reported on the SCL-90-R were very similar for males and females.

Table 1

<table>
<thead>
<tr>
<th>SCL-90-R Item</th>
<th>Percentage of Total Group Endorsing Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling easily annoyed or irritated</td>
<td>41%</td>
</tr>
<tr>
<td>2. Feeling low in energy or slowed down</td>
<td>35%</td>
</tr>
<tr>
<td>3. Feeling critical of others</td>
<td>33%</td>
</tr>
<tr>
<td>4. Worrying too much about things</td>
<td>32%</td>
</tr>
<tr>
<td>5. Feeling blocked in getting things done</td>
<td>30%</td>
</tr>
</tbody>
</table>

3. Objective B: The five resource loss (RLQ) items most frequently endorsed by our faculty sample are listed below in Table 2 with the percentage of the total sample endorsing each item noted. For more detailed information about the 10 resource loss items most frequently endorsed by the males and females in this sample, please see Appendix II. Examination of the data in Appendix II indicates that males' and females' reports of resources lost were very similar.
Table 2

<table>
<thead>
<tr>
<th>RLO Item</th>
<th>Percent of Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vegetation on your property</td>
<td>83%</td>
</tr>
<tr>
<td>2. Free time</td>
<td>65%</td>
</tr>
<tr>
<td>3. Daily routine</td>
<td>54%</td>
</tr>
<tr>
<td>4. Feeling that I am accomplishing my goals</td>
<td>50%</td>
</tr>
<tr>
<td>5. Feeling that my life is peaceful</td>
<td>47%</td>
</tr>
</tbody>
</table>

4. Objective C: Bivariate correlations indicated that high psychological distress as indicated by the SCL-90-R GSI scores was associated with: high resource loss (r = .64, p < .01), high scores on disengagement coping (r = .60, p < .01), and high scores on emotion-focused coping (r = .24, p < .01). Gender (r = .29, p < .01) and marital status (r = .20, p < .01) were also significantly correlated with distress, with females and single people reporting greater distress. Higher income was associated with lower distress (r = .15, p < .01). Correlations also revealed that high resource loss was associated with being female (r = .24, p < .01) and higher coping scores, especially higher rates of disengagement coping (r = .57, p < .01). A table detailing the correlations among resource loss, psychological distress, and coping variables is shown in Appendix III.

5. Objective D: A step-wise regression was used to determine the degree to which psychological distress, as measured by the SCL-90-R GSI scores, could be predicted based upon demographic variables, scores on the COPE, and resource loss. Approximately half ($r^2 = 50.1\%$) of the total variance of psychological distress could be accounted for in this manner, with resource loss making the greatest contribution ($r^2 = 38.8\%$). Other variables which entered into the regression equation at a statistically significant level were disengagement coping ($r^2 = 7.8\%$), marital status ($r^2 = 1.5\%$), problem-focused coping ($r^2 = 0.9\%$), distance from Charleston during Hugo ($r^2 = .6\%$), and extent to which personal decisions placed others at risk ($r^2 = 1.0\%$). Hence, resource loss, compared to demographic or coping variables, served as the best predictor of distress. Table 3 below provides the beta weights for this step-wise regression.
Table 3

Prediction of General Severity Index Scores for the Faculty Sample by Personal Characteristics, Resource Loss, and Coping Behavior

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>beta</th>
<th>R</th>
<th>R²</th>
<th>F</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: Personal Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.035</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>.076*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Income</td>
<td>-.041</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Disaster Exposure</td>
<td>.027</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Block 1</td>
<td>.315</td>
<td>.099</td>
<td>10.57</td>
<td>4,385</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Block 2: Resource Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Resource Loss</td>
<td>.450**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Block 2</td>
<td>.661</td>
<td>.437</td>
<td>230.51</td>
<td>5,384</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Block 3: Coping Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Focused</td>
<td>-.122***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion Focused</td>
<td>.044</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disengagement Focused</td>
<td>.333****</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After All Three Blocks</td>
<td>.718</td>
<td>.516</td>
<td>20.66</td>
<td>8,381</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

* Being single was associated with greater distress.
** Higher loss was associated with greater distress.
*** Less problem focused coping was associated with higher distress.
**** More disengagement coping was associated with higher distress.

6. Objective E: Table 4 below presents the percent of males and females in the high and low resource loss categories (upper most quartile v. lowest quartile) who demonstrated scores on the General Severity Index (GSI) above the clinical cut off score (T-score ≥ 63) using nonpatient norms. As predicted, the prevalence of clinically meaningful distress levels was significantly greater among people experiencing high resource loss compared to people experiencing low resource loss. These significant differences held for both males and females.
Table 4

Prevalence of clinically significant psychological distress among high and low loss males and females.

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Loss</td>
<td>Low Loss</td>
</tr>
<tr>
<td>(n=51)</td>
<td>(n=155)</td>
</tr>
<tr>
<td>34.4%</td>
<td>4.5%</td>
</tr>
<tr>
<td>[t(204) = 8.05, p &lt; .001]</td>
<td></td>
</tr>
</tbody>
</table>

7. Objective F: In order to determine which types of resource loss best explained psychological distress following Hugo, a two-step hierarchical multiple regression was performed (See Table 5 below.). The first step entered demographic variables that accounted for 9.5% of psychological distress variance. The second step entered the four resource loss variables that accounted for an additional 39.3% of the psychological distress variance. Examination of significant beta weights indicated that, in order of variance explained, these variables predicted high psychological distress: personal characteristic loss (b = .41, F(7,402) = 52.36, p < .001), social condition loss (b = .30, F(7,402) = 35.81, p < .001), and lower annual household income (b = -.09, F(7,402) = 4.64, p < .03). Hence, the loss of psychological and social resources (personal characteristics and social conditions) were most important in explaining psychological distress in our sample following hurricane Hugo.
Table 5

Hierarchical Multiple Regression Predicting Psychological Distress

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>beta</th>
<th>R</th>
<th>R^2</th>
<th>F</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Demographic Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Income</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>After Step 1</strong></td>
<td></td>
<td>.308</td>
<td>.095</td>
<td>14.20</td>
<td>3,406</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Step 2: Resource Loss Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>.41**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objects</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Conditions</td>
<td>.30**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energies</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>After Step 2</strong></td>
<td></td>
<td>.699</td>
<td>.488</td>
<td>77.12</td>
<td>7,402</td>
<td>.001</td>
</tr>
</tbody>
</table>

* p< .03
** p< .001

8. Objective G: In order to determine the effect of gender on self-reported resource loss following Hugo, a t-test was conducted upon the total loss scores for the male and female groups. This t-test revealed that female faculty members reported significantly higher loss compared to their male counterparts (t(478) = 5.37, p< .001). A graph depicting this difference can be seen in Appendix II. The mean total loss score for males was 32 compared to a mean total loss score of 45 for females.

9. Objective H: In order to determine whether psychological distress following hurricane Hugo was affected by gender, a t-test was applied to the Global Severity Index (GSI) scores for the male and female faculty groups. The mean GSI T-score for the males was 49 whereas the mean GSI T-score for the females was 53. The t-test applied to these data revealed that females reported significantly more psychological distress following hurricane Hugo than males (t(514) = 3.81, p< .0001). A graphic depiction of these results is presented in Appendix II.
10. **Objective H:** To determine whether psychological distress following hurricane Hugo was affected by the extent of loss of resources, a median split was performed on the Resource Loss Questionnaire total scores to define a high loss and low loss group. The mean GSI T-score for the low loss group was 45 whereas the mean GSI T-score for the high loss group was 57. A t-test applied to these data indicated that significantly more distress on the SCL-90-R was reported by the high loss group compared to the low loss group ($t(472) = 14.03, p < .0001$). A graph depicting this difference is shown in Appendix II.

11. **Objective I:** Normative data summarizing the alcohol and medication use changes made by our sample following Hugo are presented in Appendix IV. Of the total faculty sample, 20.4% reported increases in alcohol intake following hurricane Hugo. As shown in Table 1 of Appendix IV, approximately the same proportion of the faculty sample was abstinent from alcohol both pre- and post-Hugo (23% to 25%). The percentage of faculty who drank 1 to 7 drinks per week declined from its pre-Hugo level (67%) to a post-Hugo level of 59%. In contrast to these findings, whereas only 10% of the faculty sample drank 8 or more drinks per week prior to Hugo, a full 16% drank at that rate following Hugo. This increase in the proportion of the sample who drank 8 or more drinks per week following Hugo held up across gender and loss group (See Table 1, Appendix IV.).

Of the total sample, 12% reported starting a prescription medication following hurricane Hugo, and 10.6% of the total sample reported increases in the use of prescription medication following Hugo. Increased use of over-the-counter pain medication was reported by 27.4% of the total faculty sample, and increased use of an over-the-counter cold medication was reported by 12%. Increased use following hurricane Hugo of over-the-counter antihistamines was reported by 16.3% of the total faculty sample.

12. **Objective J:** Figures 1 - 7 shown in Appendix IV provide information about subject variables (e.g., gender and pre-Hugo drinking patterns) that are associated with increased use of alcohol and medication following hurricane Hugo. For the analyses that examined the effect of resource loss on alcohol and medication use, a median split was performed on the Resource Loss Questionnaire scores to define a high loss and low loss group. The highlights from these figures include the following findings:

a) Changes in alcohol intake after the hurricane were similar for males and females.

b) A significantly greater percentage of the high loss group reported increases in their alcohol intake compared to the low loss group.
12. Objective K: Normative data which describe the health-related characteristics of our faculty sample and the changes in health habits our sample made following hurricane Hugo are reported in Tables 1 - 5 in Appendix V. Perusal of the data shown in these tables indicates that the entire sample displayed, on average, increases from pre- to post-hurricane in snacking \( t(520) = 7.4, p < .0001 \), fast food consumption \( t(515) = 12.1, p < .0001 \), and skipping meals \( t(516) = 2.5, p < .05 \). A significant decrease in exercise frequency was also noted \( t(513) = 12.8, p < .0001 \).

Of the total sample, 15.4% reported weight gains compared to 12.8% that reported weight loss. Over half of the entire sample reported a disruption in exercise routine, and the most commonly cited obstacle to regular exercise was lack of time, followed by lack of energy and indisposed exercise facilities.

14. Objective L: In order to determine whether the extent of loss of resources was associated with disruption in health related behaviors following Hugo, a median split was performed on the total scores from the Resource Loss Questionnaire to create a high and a low loss group. Tables 2 - 5 shown in Appendix V summarize the effects of gender and loss of resources upon health related behaviors following Hugo. Perusal of these tables reveals several highlights of the data:

a) A series of two-way ANOVA's revealed that the high loss group reported significantly greater changes than the low loss group on snacking \( F(1,452) = 15.7, p < .0001 \), fast food consumption \( F(1,452) = 32.9, p < .001 \), and exercise frequency \( F(1,452) = 21.5, p < .0001 \). There were no significant gender effects or gender by loss interactions on these variables.
b) Females reported greater weight changes than males ($F(1,452) = 20.9$, $p< .0001$) and the high loss group reported greater changes than the low loss group ($F(1,452) = 11.2$, $p< .001$) (See table 4.0, Appendix V.). No gender by loss interaction was found on these variables. In addition, 50% of the high loss females reported "moderate" weight changes of 5 or more pounds, compared to 28% of the high loss males and 37% of the low loss females.

c) High loss individuals showed a significantly greater decline in exercise than low loss persons ($F(1,465) = 22.5$, $p< .0001$). No gender or gender by loss interaction was found on the variable of exercise frequency (See Table 5.0, Appendix I).

B. Results for the student sample compared to those of the faculty sample.

1. Objective A: In general, the student and faculty groups reported similar levels of loss, distress, and health habit changes. The student and faculty groups were not different on the Global Severity Index of the SCL-90-R. Mean GSI scores for the student and faculty groups were .39 and .37, respectively. Seven of the 10 most frequently endorsed SCL-90-R items were the same for both groups, suggesting similar symptom patterns.

2. Objective B: With regard to scores on the Resource Loss Questionnaire, the student and faculty groups reported comparable levels of aggregate loss. On individual items of the Resource Loss Questionnaire, 8 of the 10 most frequently reported losses were the same for the faculty and student groups. For both groups, higher loss was associated with greater distress.

3. Objectives C,D,F, G, and H: A hierarchical multiple regression analysis was applied to the student data in order to determine which variables among resource loss, personal characteristics, and coping behaviors were most predictive of psychological distress in this sample. Three blocks of variables were entered: demographic/experiential, resource loss, and coping behavior. The demographic/experiential variables were entered first as control variables (sex, marital status, household income, and prior disaster exposure). Aggregate resource loss was entered as the second predictor block. The following coping behaviors were entered as the third predictor block: problem focused coping, emotion focused coping, and disengagement focused coping.

The results of the hierarchical multiple regression are shown in Table 6. Please note that one or more asterisks indicate a significant beta weight. This is important for two reasons: first, significant beta weights indicate which variables within each predictor block are accounting for dependent variable variance; and second, the absolute size of beta weights indicates
which variables are most important in predicting the dependent variable.

Table 6  
Prediction of General Severity Index for the Student Sample Using Personal Characteristics, Resource Loss, and Coping Behavior

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>beta</th>
<th>R</th>
<th>$R^2$</th>
<th>F</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1: Personal Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.160*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>not sig.</td>
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<tr>
<td>Household Income</td>
<td>.023</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Disaster Exposure</td>
<td>-.025</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Block 1</td>
<td>.358</td>
<td>.128</td>
<td>5.78</td>
<td>4,157</td>
<td></td>
<td>.001</td>
</tr>
<tr>
<td>Block 2: Resource Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Resource Loss</td>
<td>.441**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Block 2</td>
<td>.687</td>
<td>.472</td>
<td>27.94</td>
<td>5,156</td>
<td></td>
<td>.001</td>
</tr>
<tr>
<td>Block 3: Coping Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Focused</td>
<td>-088</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion Focused</td>
<td>-038</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disengagement Focused</td>
<td>-366***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After All Three Blocks</td>
<td>.749</td>
<td>.562</td>
<td>24.49</td>
<td>8,153</td>
<td></td>
<td>.001</td>
</tr>
</tbody>
</table>

* Females were more distressed than males
** Greater loss was associated with more distress
*** Greater use of disengagement focused coping was associated with greater distress

In order to ease comparison of the results of the multiple regression equations conducted separately on the faculty and student samples, Table 7 is presented below. This table presents the percentage of the GSI variance accounted for by each predictor block when the multiple regression equations were calculated separately for the faculty and student groups.
Table 7
Percent of GSI Variance Accounted for by Each Predictor Block Contained in the Hierarchical Multiple Regression Analyses for the Faculty and Student Data.

<table>
<thead>
<tr>
<th>Predictor Block</th>
<th>Faculty Group</th>
<th>Student Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic/Experiential</td>
<td>9.5%</td>
<td>12.8%</td>
</tr>
<tr>
<td>Resource Loss</td>
<td>34.1%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Coping Behavior</td>
<td>7.9%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Total Variance Accounted for</td>
<td>51.5%</td>
<td>56.1%</td>
</tr>
</tbody>
</table>

Inspection of Table 7 indicates that for both the faculty and student groups, resource loss was the single best predictor of psychological distress. In addition, demographic/experiential variables accounted for approximately the same amount of variance in GSI scores for the faculty and student groups. Moreover, the total amount of GSI variance accounted for in the hierarchical multiple regression was approximately the same for the two groups (faculty and students) under study.

4. Objective E: To assess the role of resource loss as a risk factor for clinically significant psychological distress in the student group, we used level of resource loss (high, low) as a grouping variable and scores on the General Severity Index (GSI) as a dependent variable. Given known gender differences for SCL-90-R scores, separate analyses were conducted for male and female student participants. Specifically, participants were assigned to the high resource loss group for their gender if their resource loss score was in the uppermost 25.0% of the distribution for their gender. Conversely, the low resource loss groups consisted of individuals with resource loss scores falling in the lowest quartile of the distribution for their gender.

Among male students, the high loss group reported significantly greater levels of psychological distress ($t(68) = 3.24, p < .002$). Using non-patient norms for the General Severity Index, 21.1% of high loss student males exceeded a cutoff score indicative of clinical distress ($t$-score $\geq 63$). By contrast, only 6.1% of low loss males exceeded the cutoff. Among female students, the high loss group, compared to the low loss group, reported significantly higher
psychological distress ($t(102) = -5.25$, $p < .001$). Using nonpatient norms for the General Severity Index, 50.09% of high loss female students exceeded the T-score cutoff of 63. A more modest 18.4% of low loss females exceeded the clinical cutoff.

Comparison of the student data presented in the preceding paragraph with the corresponding data for the faculty sample (See page 9 of this report.), reveals that for both groups high resource loss is associated with significantly higher levels of clinically relevant psychological distress. Further examination of the percentage of high versus low loss students and faculty who exceed clinical cutoff scores suggests loss has a particularly strong effect within the faculty sample.

5. Objectives I and J: Students and faculty reported similar patterns of change in alcohol and medication usage following Hugo. High loss and high distress were associated with greater increases in alcohol and medication use for both groups ($p < .05$). A higher percentage of the female student group, compared to all other groups, increased their use of medications.

6. Objective K: The students reported health related characteristics (% overweight, smoking status, exercise frequency, etc.) almost identical to the faculty. The only difference being that fewer students regarded themselves as "regular exercisers."

Students' food consumption patterns after the hurricane were in the same direction as the faculty's reports. Consumption of "healthy" foodstuffs declined, whereas the consumption of those foods considered to be unhealthy in large quantities increased.

7. Objective L: Consistent with the faculty data, female students and students who reported higher levels of loss displayed significantly more change in health behaviors ($p < .05$). These changes generally were in the unhealthy direction.

As with the faculty, greater change to "unhealthy" food choices was seen in the female and high loss students.

Snacking behavior did not change for students, whereas it showed a significant increase for high loss faculty ($p < .01$).

Compared to low loss students, high loss students reported skipping significantly more meals ($p < .05$), whereas this was not different for the faculty.
Both students and faculty with higher losses reported increased consumption of fast food and a decrease in exercise.

Snacking behavior, fast food consumption, skipping meals and changes in exercise were not different between males and females for either the student or the faculty populations.

Small differences in weight change patterns were noted for both the faculty and students. Across all groups (male versus female and low versus high loss), the mean weight change in the student and faculty groups was identical ($x = 2.3$ lbs.). The absolute weight change for male students in the high and low loss groups (2.5 lbs., 2.1 lbs.) was roughly equivalent to high and low loss faculty (2.8 lbs., 1.71 lbs.). However, in the high loss group, a higher percentage of students reported weight losses (23.5%) than gains (11.7%). This trend was reversed in the faculty data with 16% reporting losses and 21.3% reporting gains. Roughly 20% of the low loss males in both populations reported weight gain; 9.1% of low loss males noted a loss, whereas only 2.9% of low loss faculty reported a loss. Thus, it appears that male students are more susceptible to losing weight than their older faculty counterparts who were more likely to gain.

Female students and female faculty in the high loss groups showed nearly identical patterns of weight change. Fifty-one percent in both groups reported weight gains, and 18% reported losses.

Low loss female students showed smaller absolute weight changes (1.8 lbs.) than low loss female faculty (3.2 lbs.). Only 19% of low loss female students reported weight gains compared to 34.8% of the low loss female faculty. The most frequently reported obstacles to an exercise routine for both students and faculty were 1) lack of time and 2) lack of facilities.

Summarizing the comparison of student and faculty data about health related issues, the experience of hurricane Hugo appeared to have affected students and faculty similarly. Unhealthy changes in food consumption, weight, and exercise patterns were noted in both groups. In general, females and high loss persons displayed greater changes. The most notable differences, which could be explained by age, were direction of weight change.
VI. References


TO: MUSC Faculty, Staff, and Students
FROM: Darlene L. Shaw, Ph.D.
        Director, Counseling & Psychological Services
SUBJECT: Psychological Effects of Hurricane Hugo

Hurricane Hugo has had a major effect on our lives. Help us understand the psychological aftermath of
the storm and become eligible to win one of two free dinners for two at Robert's Restaurant by
completing the attached survey. The drawing will be held in the Student Wellness Center Classroom at
noon on December 15. You need not be present to win.

The National Hazard Center in Boulder, Colorado awarded a grant to Counseling and Psychological
Services to study the effects of Hugo on the MUSC community. As part of that grant we are
conducting the enclosed survey.

Please be totally honest as you complete the survey. All of the information you provide will be
absolutely confidential. To participate and be eligible for one of the free dinners for two, please do the
following:

1. Detach the survey from this cover letter. Complete the survey. Do not put your name on
   the survey! This will ensure your anonymity. Place completed survey in the large pre-addressed
   envelope provided.

2. Complete this cover letter by filling in your name, department, and phone extension in the
   spaces provided below. This serves as your entry form for the drawing. Place the letter in the
   small pre-addressed envelope provided.

3. Drop both envelopes in campus mail.

If you have any questions about the survey, please call 792-4930. Thank you for taking the time to
complete the survey. The results of the survey will be published in the Catalyst and professional
journals.

Name __________________________   Department _________________________

Phone extension __________

"An equal opportunity m/f affirmative action employer"
General Background Questionnaire

Indicate your responses on this questionnaire. When a question requires a brief answer, do so in the space provided (e.g., age). When a question requires choosing alternatives, circle the answer that most accurately reflects your life.

1. Sex: M F

3. Race:
   a. asian
   b. black
   c. hispanic
   d. native american
   e. white
   f. other

5. Highest Education:
   a. High school graduate
   b. Associates degree
   c. Bachelors degree
   d. Graduate degree
   e. other

7. Annual personal income
   a. $0 to 10,000
   b. $10,001 to 20,000
   c. $20,001 to 30,000
   d. $30,001 to 40,000
   e. $40,001 to 50,000
   f. over $50,001

9. Living arrangements prior to Hugo:
   a. owned residence
   b. rented residence
   c. lived with parents
   d. other

10. Number of people living in household prior to Hugo (include self):
    1 2 3 4 5 6 7 8 or more

11. Number of dependents living in household prior to Hugo (include self, children, older relatives):
    1 2 3 4 5 6 7 8 or more
12. Where did you stay during hurricane Hugo?
   a. own residence
   b. residence of a family member or friend
   c. a shelter
   d. a hotel/motel
   e. at work
   f. other

13. Who was with you during hurricane Hugo? (circle only one)
   a. no one, I was alone
   b. family members or close friends
   c. acquaintances or co-workers
   d. other

14. How far from Charleston (the peninsula) was your place of refuge?
   a. less than 25 miles
   b. 26 to 100 miles
   c. 101 to 150 miles
   d. over 151 miles

15. To what extent did you fear for your safety during hurricane Hugo?
   
   1  2  3  4  5
   not at all moderately extremely

16. To what extent did you sustain physical harm or injury due to Hugo?
   
   1  2  3  4  5
   not at all moderately extremely

17. To what extent did your decisions regarding hurricane Hugo place you at risk for harm?
   (e.g., where to stay, when or if to leave, etc.)
   
   1  2  3  4  5
   not at all moderately extremely

18. To what extent did your decisions regarding hurricane Hugo place other people at risk for harm?
   
   1  2  3  4  5
   not at all moderately extremely

19. To what extent did other people make decisions regarding Hugo that placed you at risk for harm?
   (e.g., job/partner required you to stay)
   
   1  2  3  4  5
   not at all moderately extremely
20. How soon after Hugo did you see your residence?
   a. immediately
   b. 1 to 3 days
   c. 4 to 6 days
   d. greater than 6 days

21. Estimate the financial cost of repairing damage to your primary residence? (includes structure and contents)
   a. no cost
   b. less than $5,000
   c. $5,001 to $20,000
   d. $20,001 to $50,000
   e. $50,001 to $100,000
   f. over $100,000

22. How long were you displaced from your primary residence due to Hugo?
   a. I was not displaced at all
   b. less than 3 days
   c. 3 to 7 days
   d. 8 to 14 days
   e. 15 to 30 days
   f. 31 days or more, but I am back in my primary residence
   g. 31 days or more and I am not back in my primary residence

23. How soon after the storm did you return to your place of employment? (school for students)
   a. 1 to 3 days
   b. 4 to 7 days
   c. greater than 7 days

24. Have you ever personally experienced a natural disaster prior to Hugo? (hurricane, tornado, flood, earthquake, etc.)
   Yes___  No___

25. Are you a native of the Charleston area?
   Yes___  No___

26. How long have you lived in the Charleston area?
   a. less than 1 year
   b. 1 to 5 years
   c. 6 to 15 years
   d. over 15 years
RESOURCES QUESTIONNAIRE

Instructions: Listed below are a number of things which make life easier and/or enjoyable. Since hurricane Hugo you may have experienced a loss of many of these resources. Carefully consider each resource and rate the extent to which you have experienced a loss of that resource since Hugo. Rate the extent of loss for each resource on the following scale:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>no loss</td>
</tr>
<tr>
<td>1</td>
<td>a little bit of loss</td>
</tr>
<tr>
<td>2</td>
<td>a moderate amount of loss</td>
</tr>
<tr>
<td>3</td>
<td>quite a bit of loss</td>
</tr>
<tr>
<td>4</td>
<td>extreme amount of loss</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Personal transportation</td>
<td></td>
</tr>
<tr>
<td>2. Home contents</td>
<td></td>
</tr>
<tr>
<td>3. Time for adequate sleep</td>
<td></td>
</tr>
<tr>
<td>4. Sentimental possessions (photo albums, etc.)</td>
<td></td>
</tr>
<tr>
<td>5. Clothing</td>
<td></td>
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<tr>
<td>6. Feeling valuable to others</td>
<td></td>
</tr>
<tr>
<td>7. Family stability</td>
<td></td>
</tr>
<tr>
<td>8. &quot;Free time&quot;</td>
<td></td>
</tr>
<tr>
<td>9. Pets</td>
<td></td>
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<tr>
<td>10. Vegetation on your property (trees, shrubs, etc.)</td>
<td></td>
</tr>
<tr>
<td>11. Intimacy with one or more family members</td>
<td></td>
</tr>
<tr>
<td>12. Time for work</td>
<td></td>
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<tr>
<td>13. Feeling that I am accomplishing my goals</td>
<td></td>
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<tr>
<td>14. A good relationship with my children</td>
<td></td>
</tr>
<tr>
<td>15. Time with loved ones</td>
<td></td>
</tr>
<tr>
<td>16. Necessary tools for work</td>
<td></td>
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<tr>
<td>17. Stamina/endurance</td>
<td></td>
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<tr>
<td>18. Adequate food</td>
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<tr>
<td>19. A daily routine</td>
<td></td>
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<tr>
<td>20. Personal health</td>
<td></td>
</tr>
<tr>
<td>21. Sense of optimism</td>
<td></td>
</tr>
<tr>
<td>22. Necessary appliances for home</td>
<td></td>
</tr>
</tbody>
</table>
23. Personal residence

24. Sense of humor

25. Stable employment

26. Furnishings for residence

27. Feeling that I have control over my life

28. Essentials for children

29. Feeling that my life is peaceful

30. Ability to organize tasks

31. Intimacy with at least one friend

32. Money for "extras"

33. Understanding from my employer/boss

34. Savings or emergency money

35. Motivation to get things done

36. Support from co-workers

37. Adequate income

38. Advancement in my education or training

39. Adequate credit (financial)

40. Feeling independent

41. Companionship

42. Financial assets (stocks, property, etc.)

43. Affection from others

44. Feeling that my life has meaning/purpose

45. Involvement with church, synagogue, etc.

46. Retirement security (financial)

47. Help with tasks at home

48. Loyalty of friends

49. Help with childcare

50. Involvement in organizations with others who have similar interests

51. Financial help if needed

52. Health of family/close friends
HEALTH HABITS

1. Height: ____ft. ____in.

2. Weight: _____

3. How much has your weight changed since Hugo? (circle one & indicate amount)
   no change gained/lost ____ lbs.

4. Which statement best describes your weight loss efforts BEFORE the hurricane: (choose one)
   a. trying to eat fewer calories
   b. trying to exercise more
   c. both a and b
   d. attending a formal weight loss program
   e. not trying to lose weight

5. Which describes your CURRENT weight loss efforts (choose one)
   a. trying to eat fewer calories
   b. trying to exercise more
   c. both a and b
   d. attending a formal weight loss program
   e. I am not trying to lose weight

How many times per week did/do you eat fast foods
6. BEFORE the hurricane: 7. SINCE the hurricane:

   0 1 2 3 4 5 6 7
   8 9 10 or more

How many meals per week did/do you skip (breakfast included)
8. BEFORE the hurricane 9. SINCE the hurricane

   0 1 2 3 4 5 6 7
   8 9 10 or more

How many snacks did/do you eat per day
10. BEFORE the hurricane 11. SINCE the hurricane

   0 1 2 3 4 or more

Using the following scale, describe your intake of each of the following foods SINCE the hurricane:

1  2  3  4  5
much less  no change  much more

12. ___ red meat
13. ___ poultry/fish
14. ___ vegetables
15. ___ breads/starches
16. ___ fruit
17. ___ milk/yogurt
18. ___ cheese
19. ___ chips/crackers/pretzels
20. ___ desserts (ice cream, cookies, cake, etc.)
21. ___ chocolates/candies
22. ___ fast foods (burgers, chicken, french fries)
23. ___ pizza
24. ___ fried foods
25. ___ beverages with caffeine (coffee, soda)
26. Do you consider yourself a regular exerciser?

1 2 3 4 5
not at all somewhat very much so

27. If you exercise regularly, what type of exercise do you engage in most often: (circle one)

not a regular exerciser walking running swimming aerobic dance cycling weight training other (please specify) __________

About how many times per week did/do you exercise
28. BEFORE the hurricane 29. SINCE the hurricane

0 1 2 3 4 5 6 7
8 9 10 or more

30. Which of the following has contributed the most to changes in your exercise SINCE the hurricane: (pick one)

a. my exercise has not changed
b. not enough time to exercise
c. not enough energy to exercise
d. exercise is not as important to me
e. lack of exercise facility
f. lack of exercise partner
g. other __________

The next several questions ask about alcohol consumption. "A drink" refers to a beer, wine cooler, 4 oz. of wine, or drink containing 1 oz. of liquor.

31. Using the following scale, describe your intake of alcohol SINCE the hurricane. Have you had alcohol:

1 2 3 4 5
much less no change much more

How many drinks of alcohol did/do you usually have per week
32. BEFORE the hurricane 33. SINCE the hurricane

a. 0 b. 1-3 c. 4-7
d. 8-12 e. 13-16 f. 17 or more

During the last two weeks, how many times have you had
34. 1 or 2 drinks 35. 3 or 4 drinks 36. 5 or more
on one occasion (but no more) on one occasion (but no more)

a. none b. once c. twice
d. 3-5 times e. 6 or more a. none b. once c. twice
d. 3-5 times e. 6 or more
37. Describe your cigarette smoking **since** the hurricane.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>much less</td>
<td>no change</td>
<td>much more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

38. Which describes your cigarette smoking in the past 30 days?

a. have not smoked  
b. 1-5 cigarettes per day  
c. about one half pack a day  
d. about a pack a day  
e. about 1 1/2 packs a day  
f. 2 or more packs a day

39. Which describes your cigarette smoking **before** the hurricane?

a. did not smoke  
b. 1-5 cigarettes per day  
c. about one half pack a day  
d. about a pack a day  
e. about 1 1/2 packs a day  
f. 2 or more packs a day

40. Using the following scale, describe your use of prescription medications **since** hurricane Hugo?

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<thead>
<tr>
<th></th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>much less</td>
<td>no change</td>
<td>much more</td>
<td></td>
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</tbody>
</table>

Using the following scale, describe your intake of each of the following medications **since** the hurricane:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>much less</td>
<td>no change</td>
<td>much more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

41. __ pain relievers (aspirin, Tylenol, Nuprin, etc.)  
42. __ cold medications (Nyquil, Contac, etc.)  
43. __ antihistamines (Dimetapp, Sudafed, Actifed, etc.)  
44. __ anti-acids (Tums, Maalox, etc.)  
45. __ laxatives (Ex-lax, Correctol, etc.)  
46. __ diuretics (Aquaban, Pamprin, etc.)  
47. __ diet pills (Dexatrim, Control, etc.)  
48. __ stimulants (No-doz, Vivarin, etc.)  
49. __ nose sprays (Afrin, Neo-synephrine, etc.)  
50. __ other ____________________________

51. Please list any prescription medications that you have started taking **since** the hurricane:

______________________________________________________________________________

52. Using the following scale, describe your seat belt use **since** the hurricane.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>much less</td>
<td>no change</td>
<td>much more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hurricane Hugo produced challenges for each of us. We are interested in what you have done to cope with the challenges created by Hugo. Your responses should reflect your efforts to cope from immediately after the hurricane until today.

Respond to each item according to the scale below. Your response for each item should be written in the space corresponding to the item.

1 = I have not done this at all
2 = I have done this a little bit
3 = I have done this a medium amount
4 = I have done this a lot

1. I have tried to grow as a person as a result of the experience.
2. I have turned to my work or other substitute activities to take my mind off things.
3. I have gotten upset and let my emotions out.
4. I have tried to get advice from someone about what to do.
5. I have concentrated my efforts on doing something about the challenges.
6. I have said to myself "this isn't real."
7. I have put my trust in God.
8. I have laughed about the situation.
9. I have admitted to myself that I can't deal with the challenges and quit trying.
10. I have restrained myself from doing anything too quickly.
11. I have discussed my feelings with someone.
12. I have used alcohol or drugs to make myself feel better.
13. I have gotten used to the idea that the hurricane happened.
14. I have talked to someone to find out more about the situation.
15. I have kept myself from getting distracted by other thoughts or activities.
16. I have daydreamed about things other than this.
17. I have gotten upset, and am really aware of my feelings.
18. I have sought God's help.
19. I have made a plan of action.
20. I have made jokes about the situation.
21. I have accepted that the hurricane has happened and that it can't be changed.
22. I have held off doing anything about the challenges until the situation permits.
23. I have tried to get emotional support from friends or relatives.
24. I have just given up trying to reach my goals.
25. I have taken additional action to try to get rid of the problems.
26. I have tried to lose myself for a while by drinking alcohol or taking drugs.
27. I have refused to believe that Hugo has happened.
28. I have let my feelings out.
29. I have tried to see Hugo in a different light, to make it seem more positive.
30. I have talked to someone who could do something concrete about the challenges.
31. I have slept more than usual.
32. I have tried to come up with a strategy about what to do.
33. I have focused on dealing with the challenges, and if necessary let other things slide a little.
34. I have gotten sympathy and understanding from someone.
35. I have drank alcohol or taken drugs, in order to think about the situation less.
36. I have kidded around about Hugo.
Continue to answer each item with these response choices:

1= I have not done this at all
2= I have done this a little bit
3= I have done this a medium amount
4= I have done this a lot

37. I have given up the attempt to get what I want.
38. I have looked for something good in what is happening.
39. I have thought about how I might best handle the challenges.
40. I have pretended that the hurricane hasn't really happened.
41. I have made sure not to make matters worse by acting too soon.
42. I have tried hard to prevent other things from interfering with my efforts at dealing with this.
43. I have gone to movies or watched TV, to think about the situation less.
44. I have accepted the reality of the fact that Hugo happened.
45. I have asked people who have had similar experiences what they did.
46. I have felt a lot of emotional distress and I found myself expressing those feelings a lot.
47. I have taken direct action to get around the challenges.
48. I have tried to find comfort in my religion.
49. I have forced myself to wait for the right time to do something.
50. I have made fun of the situation.
51. I have reduced the amount of effort I'm putting into solving the challenges.
52. I have talked to someone about how I feel.
53. I have used alcohol or drugs to help me get through the challenges.
54. I have learned to live with the hurricane.
55. I have put aside other activities to concentrate on this.
56. I have thought hard about what steps to take.
57. I have acted as though it hasn't even happened.
58. I have done what has to be done, one step at a time.
59. I have learned something from the experience.
60. I have prayed more than usual.
INSTRUCTIONS:
Below is a list of problems people sometimes have. Please read each one carefully, and circle the number to the right that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Circle only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example below before beginning, and if you have any questions please ask about them.

EXAMPLE
HOW MUCH WERE YOU DISTRESSED BY:

1. Bodyaches

<table>
<thead>
<tr>
<th>NOT AT ALL</th>
<th>A LITTLE BIT</th>
<th>MODERATELY</th>
<th>QUITE A BIT</th>
<th>EXTREMELY</th>
</tr>
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<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

HOW MUCH WERE YOU DISTRESSED BY:

1. Headaches
2. Nervousness or shakiness inside
3. Repeated unpleasant thoughts that won't leave your mind
4. Faintness or dizziness
5. Loss of sexual interest or pleasure
6. Feeling critical of others
7. The idea that someone else can control your thoughts
8. Feeling others are to blame for most of your troubles
9. Trouble remembering things
10. Worried about sloppiness or carelessness
11. Feeling easily annoyed or irritated
12. Pains in heart or chest
13. Feeling afraid in open spaces or on the streets
14. Feeling low in energy or slowed down
15. Thoughts of ending your life
16. Hearing voices that other people do not hear
17. Trembling
18. Feeling that most people cannot be trusted
19. Poor appetite
20. Crying easily
21. Feeling shy or uneasy with the opposite sex
22. Feelings of being trapped or caught
23. Suddenly scared for no reason
24. Temper outbursts that you could not control
25. Feeling afraid to go out of your house alone
26. Blaming yourself for things
27. Pains in lower back
28. Feeling blocked in getting things done
29. Feeling lonely
30. Feeling blue
31. Worrying too much about things
32. Feeling no interest in things
33. Feeling fearful
34. Your feelings being easily hurt
35. Other people being aware of your private thoughts

Please continue on the following page.
<table>
<thead>
<tr>
<th></th>
<th>Feeling others do not understand you or are unsympathetic</th>
<th>36</th>
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<th>2</th>
<th>3</th>
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<td>Feeling that people are unfriendly or dislike you</td>
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<td>38</td>
<td>Having to do things very slowly to insure correctness</td>
<td>38</td>
<td>0</td>
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<td>Heart pounding or racing</td>
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<td>Nausea or upset stomach</td>
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<td>Feeling inferior to others</td>
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<td>Soreness of your muscles</td>
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<td>Difficulty making decisions</td>
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<td>47</td>
<td>Feeling afraid to travel on buses, subways, or trains</td>
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<td>Trouble getting your breath</td>
<td>48</td>
<td>0</td>
<td>1</td>
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<td>49</td>
<td>Hot or cold spells</td>
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<td>50</td>
<td>Having to avoid certain things, places, or activities because they frighten you</td>
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<td>Your mind going blank</td>
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<td>52</td>
<td>Numbness or tingling in parts of your body</td>
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<td>53</td>
<td>A lump in your throat</td>
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<td>Feeling hopeless about the future</td>
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<td>Trouble concentrating</td>
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<td>56</td>
<td>Feeling weak in parts of your body</td>
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<td>57</td>
<td>Feeling tense or keyed up</td>
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<td>Heavy feelings in your arms or legs</td>
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<td>Thoughts of death or dying</td>
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<td>Feeling uneasy when people are watching or talking about you</td>
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<td>62</td>
<td>Having thoughts that are not your own</td>
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<td>63</td>
<td>Having urges to beat, injure, or harm someone</td>
<td>63</td>
<td>0</td>
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<td>Awakening in the early morning</td>
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<td>Having to repeat the same actions such as touching, counting, or washing</td>
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<td>0</td>
<td>1</td>
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<td>Sleep that is restless or disturbed</td>
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<td>67</td>
<td>Having urges to break or smash things</td>
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<td>1</td>
<td>2</td>
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<td>68</td>
<td>Having ideas or beliefs that others do not share</td>
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<td>0</td>
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<td>Feeling uneasy in crowds, such as shopping or at a movie</td>
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<td>71</td>
<td>Feeling everything is an effort</td>
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<td>72</td>
<td>Spells of terror or panic</td>
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<td>73</td>
<td>Feeling uncomfortable about eating or drinking in public</td>
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<td>Getting into frequent arguments</td>
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<td>Feeling nervous when you are left alone</td>
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<td>76</td>
<td>Others not giving you proper credit for your achievements</td>
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<td>Feeling so restless you couldn’t sit still</td>
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<td>Feelings of worthlessness</td>
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<td>Shouting or throwing things</td>
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<td>Feeling that people will take advantage of you if you let them</td>
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<td>Having thoughts about sex that bother you a lot</td>
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<td>The idea that you should be punished for your sins</td>
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<td>86</td>
<td>Thoughts and images of a frightening nature</td>
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<td>The idea that something serious is wrong with your body</td>
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<td>Never feeling close to another person</td>
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<td>The idea that something is wrong with your mind</td>
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The Relationship Between Loss of Resources and Clinical Symptomatology Among Survivors of a Natural Disaster: A Clinical Application of the Conservation of Resources Model

Darlene Shaw, Ph.D.; John Freedy, M.A.; Pat Jarrell, M.A. and Cheryl Bene, M.A.

Department of Psychiatry and Behavioral Sciences
Medical University of South Carolina
Charleston, South Carolina

Purpose
On September 21, 1992, hurricanes Hugo came ashore at Charleston, South Carolina. As one of the largest and most powerful storms in the United States, Hugo caused widespread property damage and affected the lives of virtually everyone in its path. The purpose of this study was to:
1. Describe and quantify the symptoms of psychological distress experienced by Hugo's survivors.
2. Describe the effect of gender on self-reported losses following Hugo.
3. Determine the effect of gender on self-reported losses following Hugo.

Method
Participants
Eight weeks after the hurricane, 1200 surveys were sent out to the community in the affected part of the Medical University of South Carolina at Charleston, South Carolina. A second letter explained the purpose of the study, assured confidentiality, and gave instructions on completing the questionnaire. Individually addressing the survey overviews, it encouraged the survey overviews to complete the survey in its entirety and send it back to the Medical University of South Carolina.

Survey Questionnaire
Conservation Loss Questionnaire (Clev) and a self-report questionnaire on which subjects used 3-point Likert scales to rate the degree to which they experienced 32 symptoms in the 2 weeks following Hugo. The symptoms included: feeling of guilt, guilt, estimated, and emotional distress.

Sample
N = 130

Descriptive Statistics
Means, SDs, and frequencies for the total sample and for males and females are presented in the table below. The mean age of the sample was 40.94 years, with a standard deviation of 12.97. The sample consisted of 59% male and 41% female participants. The majority of the sample were married (80%), with an average of 3.1 children. The majority of the sample were employed (80%), with a median income of $35,000.

Data Analysis
Because the two topic-specific scales from the Conservation Loss Questionnaire were highly intercorrelated, the raw scores for these two scales were combined to create an overall score for each participant. The mean score for the overall score was calculated, and the mean score for the overall score was used to compute the Pearson correlation coefficient between gender and self-reported losses.

Summary
The results of the study indicated a significant relationship between gender and self-reported losses following the hurricane. Males reported higher levels of psychological distress than females. The study also showed that males were more likely to report symptoms of depression, anxiety, and post-traumatic stress disorder. The results of this study suggest that future research should focus on the unique experiences of males and females in the aftermath of a natural disaster and the impact of gender on psychological distress following such events.
RESOURCES LOSS, COPING AND PSYCHOLOGICAL DISTRESS: AN EMPIRICAL TEST OF A THEORETICAL MODEL

Freedy, J.R., Shaw, D. Jarrell, M.P., and Bene, C.

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Medical University of South Carolina
Charleston, South Carolina

INTRODUCTION

It is important to understand individual adjustment following natural disasters. Literature review indicates that exposure to natural disaster is alarmingly common (Beam, 1998). Most important in mental health research, disaster exposure can produce both acute and chronic psychological distress (Brown, 1990). A wide range of methodologies are used to study the effects of natural disasters, most commonly following a mixed-methods design. This study sought to examine the impact of natural disasters on mental health outcomes.

METHOD

Approximately 8 weeks after Hurricane Hugo devastated Charleston, South Carolina, questionnaire sets were mailed to 1,200 employees of the Medical University of South Carolina in Charleston. The questionnaire sets included the following:

1. Personal Characteristics
2. Coping Strategies
3. Global Severity Index

RESULTS

Table 1 presents data addressing the third hypothesis concerning resource loss as a risk factor for psychological distress. The percent of males and females in high and low resource loss categories who demonstrated scores on the global severity index above the clinical cut-off score (50) were compared. As predicted, the prevalence of clinically significant distress levels was significantly greater among people experiencing high resource loss compared to people experiencing low resource loss. These significant differences held for both males and females.

SUMMARY OF KEY FINDINGS

1. Subsequent to natural disaster, increased levels of resource loss are positively associated with increases in both psychological distress and coping behavior.
2. Post natural disaster adjustment can be viewed as a process in which psychological distress (e.g., resource loss) are more important than personal factors (e.g., demographic characteristics and coping behavior) in determining psychological distress.
3. High levels of resource loss are associated with the increased prevalence of clinically significant distress levels of psychological distress.

REFERENCES

1. This research was supported by a grant from the National Hazards Research and Applications Center, Boulder, Colorado
NORMATIVE ALCOHOL AND MEDICATION USE FOLLOWING A NATURAL DISASTER

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Department of Psychiatry and Behavioral Sciences
Medical University of South Carolina
Charleston, South Carolina

INTRODUCTION

It is generally agreed that disaster victims, such as natural disaster victims, significantly affect psychological functioning and behavior of its victims. While information concerning the reactions to natural disasters has occurred in recent years, relatively little is known about the patterns of alcohol and medication use following disasters. Normative information of this type is crucial in order to understand the responses and meet the needs of natural disaster victims. Further, if variables could be identified that predict groups at high risk for increases in alcohol and medication use, interventions could be delivered more efficiently to these target groups.

On September 16, 1996, hurricane Hugo came ashore at Charleston, South Carolina. A category 5 hurricane, Hugo ravaged the coastline with sustained winds of 155 mph and total surges of 25 to 30 ft above high tide. Not only was hurricane Hugo one of the most powerful storms in the continental U.S., but also one of the largest. Hurricane force winds radiated 100 miles from the eye of the storm. Consequently, the damage caused by the storm was unprecedented: approximately 3 million people were affected. 26 lives were lost, and hundreds of people were seriously injured. Seventeen thousand people were left jobless, over 3,000 homes were destroyed, and another 100,000 homes were rendered uninhabitable. In the Charleston area alone, property damage estimates were in excess of 4 billion dollars.

METHOD

A week after the hurricane, 1200 surveys were sent to the campus mail and to the faculty and professional staff at the Medical University of South Carolina at Charleston, South Carolina.

Survey materials included

Demographic Questionnaire
Health Status Questionnaire
Resource Loss Questionnaire (listbox)

A cover letter explained the purpose of the study, ensured confidentiality, and gave instructions on completing the questionnaires.

Individually completing the survey were given the opportunity to enter a drawing for 2 gourmet dinners valued at $120.00. Return envelopes and an entry form to the drawing were included.

A median split was performed on the Loss Questionnaire scores to define a high and low-loss group. Data are presented by gender and loss group.

Sample Characteristics

N=325 (267 males, 58 females) - 43% response rate

Race:

92% white
6% black
2% other
6% divorced/separated

Education:

94% graduated degree
5% $50,000
12% $40,000
12% $30,000
12% $20,000
12% $10,000
12% $50,000

TABLE 1

PERCENT OF GENDER AND LOSS GROUPS REPORTING INCREASES IN ALCOHOL INTAKE PRE AND POST-HURRICANE

<table>
<thead>
<tr>
<th>Gender</th>
<th>Low</th>
<th>High</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>22.3</td>
<td>24.7</td>
<td>23.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Male</td>
<td>23.9</td>
<td>26.3</td>
<td>23.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Female</td>
<td>20.8</td>
<td>22.0</td>
<td>21.3</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Figure 1

Percent of loss/gender groups reporting increases in alcohol intake

Note: 20% of the total sample reported increases in alcohol intake

Figure 2

Pattern of loss/gender groups reporting increases in alcohol intake by pre-hurricane drinking behavior

Figure 3

Percent of loss/gender groups starting prescription medications

Figure 4

Percent of loss/gender groups reporting increases in prescription medication use

Figure 5

Percent of loss/gender groups reporting increases in over-the-counter pain medication

Figure 6

Percent of loss/gender groups reporting increases in over-the-counter cold medication use

Figure 7

Percent of loss/gender groups reporting increases in over-the-counter antihistamine use

Note: 12% of the total sample reported increases in over-the-counter cold medication use

Note: 16% of the total sample reported increases in over-the-counter antihistamine use

SUMMARY

30% of the sample reported increases in alcohol intake after hurricane

Changes in alcohol intake after the hurricane were similar for males and females

Analyses of drinking behavior before and after the hurricane revealed an increase in heavy drinking in the low-loss group but not in the high-loss group.

Post-hurricane drinking behavior showed a significant increase in the low-loss group compared to the pre-hurricane drinking behavior.

The data suggest that gender and loss with regard to natural disasters may influence medication use.

These data suggest more effective for gender and loss with regard to natural disasters in future studies.

Presented at the 24th Annual Convention of the Association for the Advancement of Behavior Therapy.
The Disruption of Health Maintenance Behaviors Following Traumatic Stress:
Implications for Clinical Intervention

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Institute of Psychiatry and Behavioral Sciences
Medical University of South Carolina
Charleston, SC

Appendix V

Introduction

The purpose of this study was to examine the relationship between traumatic stress and health maintenance behaviors. The hypothesis was that individuals who experience traumatic stress will exhibits decrements in health maintenance behaviors compared to those who do not experience traumatic stress.

Method

Participants were recruited from a local community mental health center. The sample consisted of 100 individuals, 50 of whom experienced traumatic stress (TS) and 50 of whom did not experience traumatic stress (N). The TS group was identified through self-report measures, while the N group was identified through a control group. Both groups were assessed on measures of health maintenance behaviors, including smoking, exercise, and diet.

Results

A series of t-tests were conducted to examine the differences between the two groups. The TS group reported significantly lower levels of smoking, exercise, and diet compared to the N group. The results suggest that traumatic stress is associated with decrements in health maintenance behaviors.

Discussion

The findings of this study provide support for the hypothesis that traumatic stress is associated with decrements in health maintenance behaviors. These findings have important implications for clinical practice, as interventions targeting traumatic stress may be effective in improving health maintenance behaviors.

Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>TS</th>
<th>N</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>20</td>
<td>30</td>
<td>.03</td>
</tr>
<tr>
<td>Exercise</td>
<td>10</td>
<td>20</td>
<td>.01</td>
</tr>
<tr>
<td>Diet</td>
<td>15</td>
<td>25</td>
<td>.02</td>
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Table 2

<table>
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<th>Measure</th>
<th>TS</th>
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<tbody>
<tr>
<td>Mean Age</td>
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<td>40</td>
<td>.05</td>
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<tr>
<td>Education</td>
<td>12</td>
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</tr>
<tr>
<td>Income</td>
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<td>.04</td>
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Table 3

<table>
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<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Mean Weight</td>
<td>150</td>
<td>140</td>
<td>.01</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>25</td>
<td>23</td>
<td>.03</td>
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</table>

Table 4

<table>
<thead>
<tr>
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<th>N</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Blood Pressure</td>
<td>120</td>
<td>110</td>
<td>.02</td>
</tr>
<tr>
<td>Serum Cholesterol</td>
<td>200</td>
<td>180</td>
<td>.03</td>
</tr>
</tbody>
</table>

Summary of Findings

- Traumatic stress is associated with decrements in health maintenance behaviors.
- Interventions targeting traumatic stress may be effective in improving health maintenance behaviors.

Presented at the 24th Annual Convention for the Association for the Advancement of Behavior Therapy, November 1-4, 1990 in San Francisco, California.